

# COMPUTERWORLD

## INSIDE

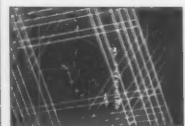
**Executive Report —**  
Restructuring IS in  
the wake of down-  
sizing. Page 71.

**In Depth —** Holy  
light waves! Optical  
computing is on its  
way. Page 83.

**It's here— really.** Lotus  
finally ships Release 3.0 of  
1-2-3. Page 4.

**Micro Channel endorsed**  
as American Airlines stan-  
dardizes on 80386-based  
systems supporting the IBM  
bus architecture. Page 4.

**What a month:** Brzezinski  
bails out of Quaker Oats,  
Fisher retires from Banc  
One and Sun Co.'s IS chief  
moves on to a home shop-  
ping service. Page 119.



**Innovative use of technol-  
ogy** cited in *Computerworld*  
Smithsonian Awards.  
Pages 120, 121.

**Computerworld  
Perspectives 1989:**  
IS organizations can no  
longer rely on automating  
business  
structures dat-  
ing back to  
1949. Also,  
partnerships  
spell success  
in the busi-  
ness world,  
say leading IS  
execs.  
Stories, page 6.

## CA buyout binge swallows Cullinet

*Uncertainty ends,  
but deal raises  
support concerns*

BY ROBERT MORAN  
CW STAFF

Many users of Cullinet Software, Inc.'s IDMS/R database management system resigned themselves to waiting for further information on what direction Computer Associates International, Inc. plans to take with its overlapping DBMS products in the wake of its latest proposed acquisition last week.

Given that CA already has two other database managers — CA-Datcom/DB and CA-Universe — some users are worried enough by the change in ownership of IDMS/R to reconsider their options.

Sanjay Kumar, CA's vice-president of strategic planning,



John Cullinan

### CA adds to:

- 6,500 employees worldwide
- \$1.03 billion in revenue for fiscal 1989
- Fiscal 1989 net income of \$163.5 million
- Marketing clout
- Mixed user reviews of service and support following acquisitions
- Broad product array

JOHN CULLINAN PHOTO: SETH RESNICK

attempted to reassure Cullinet users after Monday's announcement of the Garden City, N.Y.-based software giant's latest in a long string of approximately 19 acquisitions.

### Cullinet turns over:

- 1,800 employees
- \$202.9 million in revenue for fiscal 1989
- Loss of \$19.8 million in fiscal 1989
- Database technology, VAX software
- Application generation tools
- Vertical market applications
- Large, high-profile user base



Charles Wang

CW CHART

"We will continue to enhance and support IDMS/R" and will give customers detailed directions a few weeks after the merger is completed in August, Continued on page 119

*Gun-shy users  
may opt for IBM*

### ANALYSIS

BY NELL MARGOLIS  
CW STAFF

Last fall, an information systems executive at a huge Midwestern financial corporation was asked which software suppliers his firm dealt with. He stopped, thought and finally answered, "Basically, I guess they're all CA now. And those that aren't yet are probably about to be."

Now worth \$1.03 billion and growing, Computer Associates International, Inc. is trying to temper its reputation as the "grand acquirer" of the software industry, according to analysts, users and its own press releases. But last week, the company proposed to gob- Continued on page 119

## White knight sweeps up Prime

BY NELL MARGOLIS  
CW STAFF

An eleventh-hour rescue that analysts doubted would ever take place did just that Friday when venture capital pioneer J. H. Whitney & Co. rode onto the scene to save Prime Computer, Inc. from what appeared to be near-certain takeover by hostile bidder MAI Basic Four, Inc.

DR Holdings, Inc., a Delaware corporation formed by Whitney, entered into a merger agreement under which a DR subsidiary will offer \$21.50 per share in cash for approximately 79% of the embattled minicomputer vendor's outstanding common stock. The agreement was unanimously approved by Prime's board.

The Whitney company's tender offer is slated to start

Thursday, backed by financial commitments from Shearson Lehman Hutton Holdings, Inc., Chemical Bank and the First National Bank of Boston.

At face value, the offer is a superior financial alternative to

MAI's most recent stated bid of \$19.50 per share. Only hours before the new offer arrived, MAI Chairman Bennett LeBow wrote to the Prime board stating MAI's intention to raise its offer in the Continued on page 8

## U.S. snips airline link

BY ALAN J. RYAN  
CW STAFF

WASHINGTON, D.C. — American Airlines and Delta Air Lines said last week they were dropping plans to form a computer reservation system partnership following the U.S. Department of Justice's announcement that it planned to try to block the partnership in court.

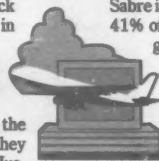
The chief executives of both airlines expressed disappointment with the decision but said they will not contest the Justice Department because such action would be too time-consuming.

Under the agreement, Delta

was to pay American \$650 million over two years for a 50% stake in the partnership, which would combine Delta's Datas II system with American's Sabre.

According to the Justice Department, Datas II is the fifth largest CRS; with \$68 million in revenue in 1988, it held 7% of the national market. American's Sabre is the largest CRS, holding 41% of the national market and garnering \$445 million in revenue last year.

U.S. Attorney General Dick Thornburgh said Thursday that the airlines had been advised of the Justice Department's intent to file a civil antitrust suit to block the CRS venture. However, a depart- Continued on page 4



## Too early for PS/2 users to buy into 486

BY WILLIAM BRANDEL  
CW STAFF

IBM's attempts to convince information systems managers that it is a leader in personal computer technology fell on skeptical ears last week as users questioned whether the company can keep its promise to deliver an i486 upgrade to the Personal System/2 Model 70 in the fourth quarter.

IBM announced last week that it would offer a \$3,995 plug-in card for the Model 70 A-21 that upgrades the processor to a 25-MHz i486. Combined with a 25% price cut on the Model 70 A-21, the system will reportedly offer three to four times the processing power of the current high-end desktop system for \$1,700 more.

However, some users doubted that IBM can meet its fourth-quarter delivery date for the upgrade, given that Intel Corp. will not ship the i486 before then. Continued on page 8

NEWSPAPER

#530\*\*\*\*\* 5-DIGIT 49106  
#U7U7E300#039669# 0010110589

UNIVERSITY MICROFILMS INT 355  
UNIVERSITY MICROFILMS INT  
SERIAL PUBLICATIONS  
300 N ZEEB RD  
ANN ARBOR MI 48106

SECOND CLASS

# IN THIS ISSUE

## NEWS

- 4 Users can snuff out their 1-2-3 Release 3.0 vigil candles now: It's here!
- 4 American Airlines sketches two-year systems itinerary.
- 6 Hammer and Co. president nails down IS organization theories at *Computerworld Perspectives* conference.
- 7 Bush expected to pinpoint Sikes for FCC chairman any time now.
- 7 DRAMatics: U.S. vendors take their cue to fund chip venture.
- 10 IBM puts a dab of CICS behind its ESA, hoping to attract more customers to MVS/ESA.
- 12 Two more sign on for AT&T's Tariff 12.
- 14 Oracle 6.0 offers one-stop shopping solution for distributed database applications.
- 17 Alleged hacker ring-leader charged with 17 counts of fraud.
- 120 Eleven technology-applications leaders recognized at *Computerworld* Smithsonian Awards.

## Quotable

*"We are embedding in silicon many organizational structures that are 40 years old."*

MICHAEL HAMMER  
HAMMER AND CO.

*On organizational resistance to changing procedures to take better advantage of computerization. See also page 6.*

## SYSTEMS & SOFTWARE

- 23 AS/400 veterans flash a yellow light at oncoming System/36 migration traffic.
- 25 Associated Grocers stocks mom-and-pop shops' IS shelves.

## PCs & WORKSTATIONS

- 37 Library of Congress jogs its Memory, offering the public access to manuscripts and photographs via compact disks and laser videos.

## NETWORKING

- 49 Rockwell wades into the ISDN waters, installing a cost-reducing, Centrex-like network.

## MANAGER'S JOURNAL

- 61 'Change' always jingling in IS professionals' pockets.

## COMPUTER INDUSTRY

- 93 Independent evaluation committee whets the ax at beleaguered Miniscribe.
- 93 Cullinet veteran recalls firm's crazy but worthwhile roller coaster ride.

## EXECUTIVE REPORT

- 71 You can't move to smaller platforms without rearranging some assumptions.

## IN DEPTH

- 83 Switching the light fantastic with optical computing. By Lee Gruenfeld.

## DEPARTMENTS

- 8 News Shorts
- 20 Editorial
- 64 Calendar
- 100 Computer Careers
- 111 Marketplace
- 116. Training
- 118 Stocks
- 122 Trends

**F**OR ALL the hype over the emergence of Unix as a standard operating environment, some recent research from Paine Webber paints a more "standard" emerging standards picture. When asked to list standards that are requirements for purchases today and in the future, some 1,000 survey respondents listed IBM's SNA and SAA as No. 1 and 2, respectively. Unix dawdled in a distant third place, slightly ahead of OSI. The survey further showed "strong" development efforts for OS/2 under way, while the Micro Channel loomed increasingly important in IS planning. This trend is bound to produce the Blues for other firms.



*Easy bets on low-cost technology prove to be a boon for these businesses. Page 61.*



ANDY FREEDBERG  
Citibank's Contorno says small systems make quick work of applications development. Page 71.

# EXECUTIVE BRIEFING

■ **Cullinet users are taking a wait-and-see approach** to the proposed acquisition of Cullinet by Computer Associates. Some expressed relief that Cullinet's product line has a future, but others worried about the depth of CA's commitment to support and maintenance. Analysts said IBM may be the surprise winner in the deal because DB2 could become a safe harbor for DBMS buyers. **Page 1.**

■ **More high-level IS departures:** Quaker Oats' Ron Brzezinski has left with a generous severance package; John Fisher, considered the father of the ATM and the bank credit card, will retire from Banc One Services; and Sun Co.'s John F. Link will become the top IS executive at QVC Network, a home shopping network. **Page 119.**

■ **It's up to information systems execs to take the lead** in bringing users and information technology together, speakers at the *Computerworld Perspectives 1989* conference said last week. Several have devised innovative programs to get users involved. **Page 6.** Too many corporations are simply automating old organizational structures instead of looking at computers as an opportunity to create new ones, speakers said. **Page 6.**

■ **Lotus meets expectations**, shipping 1-2-3 Release 3.0 a week before its latest deadline. Users say it appears to do what Lotus promised and looks bug-free. **Page 4.**

■ **It's a daughter!** Board, that is, with an i486 chip on it, turning the PS/2 Model 70 A-21 into the fastest PC on the market. IBM's announcement of the 486 daughter-board, combined with a 20% price cut on the Model 70, is intended to boost IBM's technology image. Compaq predicts that users won't buy it. **Page 1.**

■ **Downsizing means changing procedures** and organizational structures, not just technology. Management issues range from administrative details such as how to implement chargeback to larger questions of how to share processes and responsibilities with business users. **Page 71.** Downsizing does not have to diminish information costs in other areas of the business. Moving to smaller platforms makes good general sense, but it is not the answer for everyone. **Firm's Page 61.**

shouldn't make the mistake of downsizing just because it's popular. **Page 77.**

■ **Producers of the Live Aid concert**, developers of a system that "ages" photographs of missing children and overseers of the Passaic River Basin Early Flood Warning Project were among the 11 winners of *Computerworld* Smithsonian Awards last week. **Page 120.**

■ **Don't be discouraged** if users appear to be taking less than complete advantage of the software they purchase. Managers say that those users are probably still getting their money's worth as long as they realize some benefits from technology. **Page 37.**

■ **The Library of Congress goes optical** as it launches an ambitious plan to package thousands of its historical books, political cartoons, documents and photos on optical disks. The first collection is scheduled to be completed next year. **Page 37.**

■ **Rockwell International is phasing in ISDN** one step at a time. Early applications like modem-pooling are saving money now and may lead to more ambitious uses linking customer databases to phone lines. **Page 49.**

■ **Sometimes the simple ideas are the best.** A medical insurer turned a fax machine into a lifeline by redesigning printed forms; a casino used direct mail to increase its business; a chemical tanker replaced overnight mail with electronic mail and expedited turnaround. IS was at the center of all of them. **Page 61.**



# CA DATACOM/DB

## The Best Database Now Comes With A Couple Of Extras.

CA-DATACOM/DB™ is now supported  
by the technological and financial  
strengths of Computer Associates.

With its unique combination of comprehensive RDBMS facilities and unsurpassed performance, DATACOM/DB has always been a superior database.

Now, backed by our commitment to protect your database investment, CA-DATACOM/DB stands ready for the future by giving you SQL support without costly hardware or software upgrades.

Additionally, CA-DATACOM/DB provides an active data dictionary to define, control and protect your data. Automated migration software lets you convert to CA-DATACOM/DB from VSAM, IMS or TOTAL\* without costly rewrites. You can distribute data across multiple computer sites. And you can get it with CA-IDEAL, a complete 4th generation application development environment.

For more information, call Jamie Brooks at  
1-800-237-9273.

CA-DATACOM/DB is compatible to IBM MVS/VS1/VM. \*TOTAL is a product of Cincom Systems, Inc.  
© 1989 Computer Associates International, Inc., Route 206 & Orchard Road, CA-S, Princeton, NJ 08543-0000

**COMPUTER  
ASSOCIATES**  
Software superior by design

# Finally! Lotus ships delayed Release 3.0

BY DOUGLAS BARNEY  
CW STAFF

CAMBRIDGE, Mass. — The vigil is over. After more than two years on tenterhooks, customers can now order and receive shrink-wrapped versions of Lotus Development Corp.'s 1-2-3 Release 3.0.

The long-delinquent product severely tested the loyalty of the Lotus customer base. Although relieved, many users burned by the release of unstable software from software vendors were

cautiously optimistic.

To calm fears of bugs and incompatibility, Lotus officials pointed to their \$15 million investment in testing Release 3.0, which included the running of 11,000 macros. Users interviewed have reported no problems to date.

Such testing and the job of re-writing the program entirely in the C language created several image-bruising delays. In fact, a humbled Lotus Chairman Jim P. Manzi called Release 3.0 the "moral equivalent of the Boston

Red Sox in the World Series."

One of the critical concessions that Lotus made to the program's girth is its inability to run on Intel Corp. 8088 and 8086 machines. However, it offers a system that runs under MS-DOS or OS/2, with either operating system able to directly access up to 16M bytes of random-access memory.

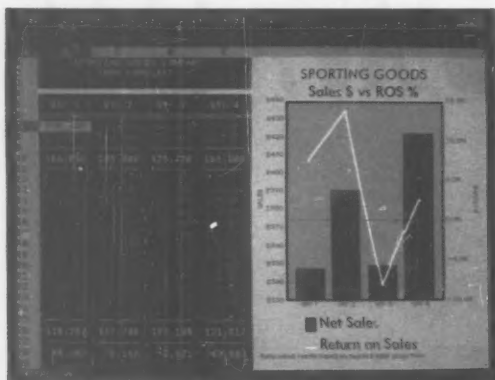
## The main additions

The key enhancements to Release 3.0 include a new programming language for developing compiled and secure spreadsheet applications, a specification for generating database queries from within a spreadsheet and three-dimensional spreadsheets.

R. L. Martin, manager of executive support systems at Eaton Corp., has already used the beta-test version to build a consolidation application that uses live data and works well.

In particular, the 3-D and linking facilities appear alluring enough to redesign some key applications to exploit Release 3.0, Martin said.

But for some, Release 3.0 is too late. Instead of twiddling his thumbs, Bob Scheussler said he helped create a custom pricing application for Rockwell International Corp., an application that would have been perfectly suited for Release 3.0. "We needed this product a year ago," said Scheussler, director of IS technologies at Rockwell.



Lotus' 1-2-3 Release 3.0 adds new language, 3-D spreadsheets

## Airline

FROM PAGE 1

ment spokesman said Friday that if the airlines agree to drop the plans, it was unlikely that the antitrust suit would be filed.

The joint venture plans, announced in February and valued at approximately \$2 billion, would eliminate one of the five CRS competitors "and therefore could result in higher charges to travel agents for using CRS services," according to Thornburgh.

However, Ron Allen, chairman of the board and chief executive officer at Delta, claimed in a statement last week that the

partnership had been "designed to operate as an autonomous, independent entity open to participation by other airline and non-airline participants."

Robert L. Crandall, chairman and president at American, said in a prepared statement that the agreement had been structured "to satisfy the previously expressed concerns of several departments of the U.S. government about single-carrier ownership of CRS systems."

Crandall said American will not attempt to create other joint ventures with domestic airlines that sponsor a competing CRS but will continue to offer partnership interests in Sabre to domestic airlines that do not spon-

sor a competing CRS as well as foreign airlines.

Kevin Wayland, a spokesman for Northwest Airlines, said Northwest was pleased with the Justice Department's decision.

"It was our position that a merger between the computerized reservation systems owned by Delta and American would have further restricted competition" in the CRS arena, Wayland said.

Northwest felt that such a merger could eventually lead to another wave of consolidation among airlines and had argued its position to the Justice Department, Wayland said. Officials from other airlines declined to comment.

# American takes flier on 80386

BY WILLIAM BRANDEL  
CW STAFF

American Airlines last week announced it will standardize on systems based on the Intel Corp. 80386 and said it plans to buy 50,000 systems during the next two years from three vendors. IBM's Micro Channel Architecture (MCA) was a crucial aspect of the selection, with American designating IBM and two other MCA supporters as suppliers.

Although American would not specify how many of each vendor's product will be chosen, a spokeswoman said that each is guaranteed at least a 10% share of the total 50,000-unit purchase.

IBM will supply a range of systems, including the Personal System/2 Model 55SX, a diskless version of the Model 55SX that is based on the Intel 80386SX chip and the PS/2 Model 70, based on Intel's 80386. Other selected vendors were Tandy Corp., which will supply its 4000 SX series, and AT&T, with a system based on the 80386 chip, according to the American spokeswoman. The systems replace existing IBM 3270 terminals, she added.

The vendors were chosen by a variety of criteria, including the vendor's future technological direction and MCA bus support, she said. For this reason, Compaq Computer Corp. was not chosen, she indicated.

AT&T's systems will be used by Sabre Travel Information Network division travel agency customers, she said. IBM's diskless systems will be headed for American's domestic reservations offices and for Sabre customers.

The Tandy PCs are expected to be used in domestic airport terminals and at certain maintenance locations.

## CORRECTIONS

Due to an inaccuracy in an AT&T press release, John Miller was incorrectly identified as heading up marketing as well as research and development at AT&T Paradyne [CW, June 5]. Miller will actually have responsibility only for R&D, according to a subsequent release from AT&T.

Richard P. Delio is the controller of EG & G, Inc. [CW, June 12]. John R. Dolan is senior vice-president and chief financial officer. George Garland, corporate director of information systems, reports to Delio.

## COMPUTERWORLD

### Editor in Chief

Bill Laberia

### Executive Editor

Paul Giffin

### News Editor

Peter Bartolik

### Assistant News Editor

James Connolly

### Senior Editors

Clinton Wilder, Management  
Elisabeth Horwitz, Networking  
Patricia Keefe, Workstations  
Douglas Barney, PCs & Workstations  
Stanley Gibson, Software  
Michael Alexander, PCs & Workstations  
Rosemary Hamilton, Systems  
Neil Margolis, Industry

### Senior Writers

Alan J. Ryan

Amy Cortese

William Brandel

James Daly

### Staff Writer

Richard Pastore

### News Products Editor

Sally Cusack

### Features Editors

Glenn Rifkin

Joanne Kelleher

### Senior Editor

Michael L. Sullivan-Trainor

### Senior Writer

David A. Ludlum

### Associate Editors

Deborah Fickling

Kelly Shea, In Depth

Jodie L. Cook

### Researcher

Kevin Burden

### Assistant Researchers

Jodie Naze

Kim Nash

### Chief Copy Editor

Mary Grover

### Assistant Chief Copy Editor

Donald St. John

### Features Copy Editor

Joseph J. Fattori

### Copy Editors

Cathleen A. Duffy

Joyce Chutichian

Carol Hildebrand

Gary Byrne

### Art Director

Nancy Kowal

### Graphics Specialists

Frank C. O'Connell

John B. York

### Graphics Researcher

Laura O'Connell

### Assistant Graphics Researcher

Paulo Costa

### Assistant to the Editor in Chief

Linda Gorgone

### Editorial Assistants

Lorraine Witzel

Tammy Gryniwicz

Chris Lindquist

### Rights and Permissions Manager

Sharon Bryant

### News Bureaus

Mid-Atlantic

201/967-1350

Robert Moran, Correspondent

Washington, D.C.

202/347-5718

Mitch Betts, Bureau Chief

West Coast

415/347-0555

Jean Borman, Bureau Chief

J.A. Savage, Senior Correspondent

Patrick Waurzyniak, Correspondent

Chris Flanagan, Editorial Assistant

### Midwest

312/827-4433

Ellis Bookler, Correspondent

### Computerworld Focus on Integration

### Editor

Ann Dooley

### Managing Editor

Lory Zottola

### Senior Editor

Stan Kolodziej

### Senior Writer

Helen Pike

### Art Director

Tom Monahan

### IDG News Service

Penny Janzen, Director

### Main Editorial Office

Box 9171, 375 Cochituate Road

Framingham, MA 01701-9171

508/879-0700

Subscriptions: 800/669-1002

Second-class postage paid at Framingham, Mass., and additional mailing offices. Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Copyright 1988 by CW Publishing Inc. All rights reserved. Computerworld can be purchased on 35 mm microfilm through University Microfilms Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed: back issues, if available, may be purchased at \$2.00 per issue, plus postage. Call (800) 669-1002.

Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$0.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970.

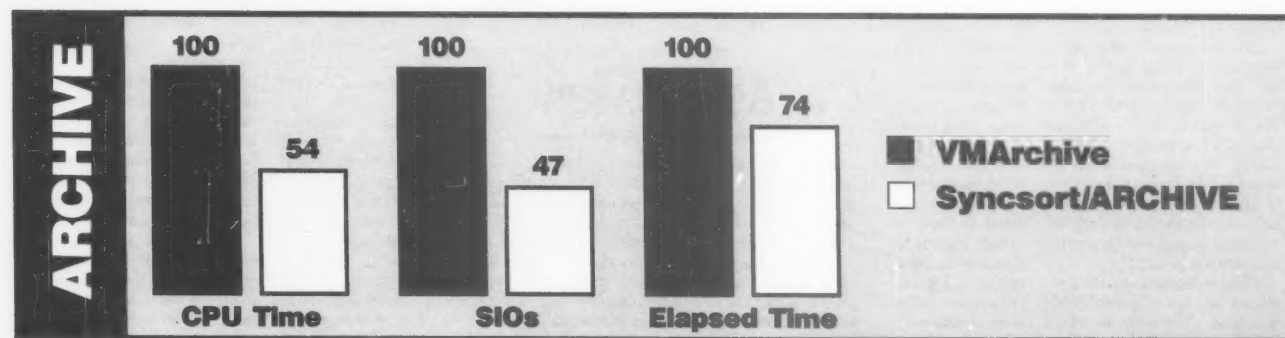
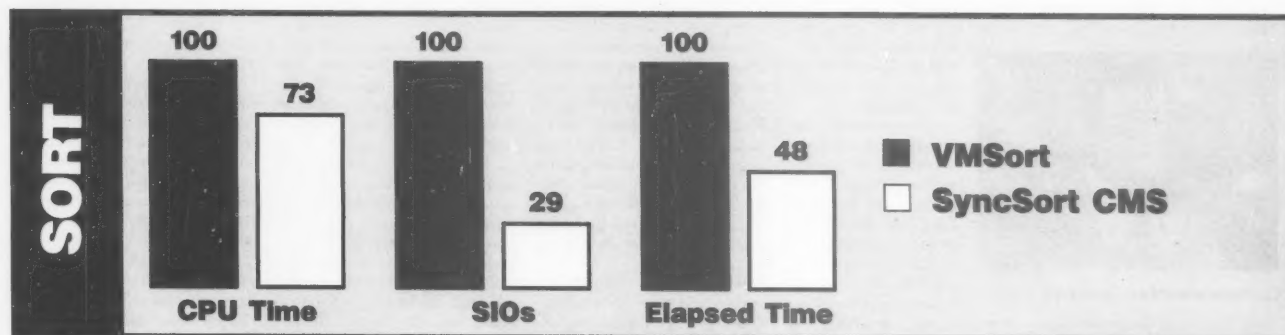
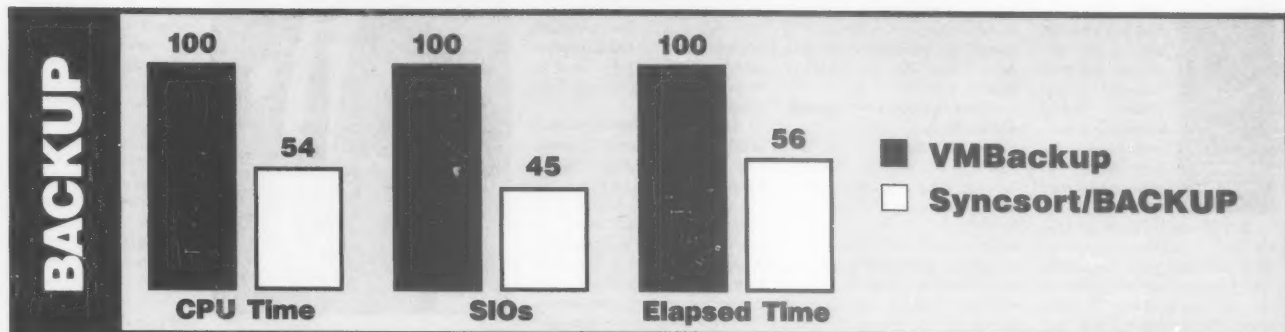
Reprints (minimum 100 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 669-1002.

Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: \$2.00 a copy: U.S. — \$48 a year; Canada — \$110 a year; Central & So. America — \$130 (surface), \$250.00 (airmail) a year; Europe — \$195 a year; all other countries — \$295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

# VM PERFORMANCE FROM SYNCSORT



**Deal your system a winning hand.**

To arrange for a test on your system, call us at (201) 930-8200, and see what VM performance from Syncsort can do for you.

**syncsort**  
INC.

**WHERE PERFORMANCE IS THE ISSUE.**



## IS execs now becoming go-betweens for business

BY CLINTON WILDER  
and ALAN J. RYAN  
CW STAFF

**NEW YORK** — The job description of the successful information systems executive, having evolved from technologist to businessman, includes a new role: matchmaker.

Top IS executives must take the lead in forging partnerships with business unit managers, said speakers and attendees at the *Computersworld Perspectives 1989* conference here last week.

"I have to set up the lunches," said Tom Pettibone, senior vice-president of IS at

The first rule of thumb, said Coca-Cola Foods' Director of Applied Information Technology Cheryl Currid, is understanding where information services stand within your company. "In some firms, information services are still dead last" on the list of priorities, she said.

Other tips from Currid included the following:

- Translate technical talk into business talk so line managers and the chief executive officer understand your plans in plain English.

- Get users to help design their systems — don't let the systems department be a vacuum.

- Form a steering committee of functional line managers. They will work hard to sell the CEO on systems that will help them.

- Keep educating the CEO on where systems are going and what they can do.

- Make IS part of the firm and share the company's vision.

The successful implementation of expert systems is impossible without business user involvement at every step, said Ed Mahler, program manager for artificial intelligence at Du Pont Co. "The key to success is ownership,

ownership and ownership" of the systems by the users, he said.

When systems and other business areas do not work together, problems can arise. New York Life's Howard F. Maroney, corporate vice-president of information systems and services, said that his company decided to build a group insurance claims processing center in Ireland to realize substantial cost savings. But the location of the building was selected by the business people, who never consulted the systems personnel.

The operation is in a rural location, which is only now installing digital telecommunications capacity, for example. "Most of the problems we had were start-up problems," Maroney said.

## Rethink before automating

BY JEAN S. BOZMAN and  
ALAN J. RYAN  
CW STAFF

**NEW YORK** — The information systems organization of 1989 may be automating the corporate organization of 1949 — a time when U.S. businesses, in stark contrast to today's corporate climate, needed to do little more than merely manage their growth.

That is the thesis of Michael Hammer, president of Hammer and Co., a Cambridge, Mass.-based IS consulting firm. "We are embedding in silicon many organizational structures that are 40 years old," said Hammer, a keynote speaker at the *Computersworld Perspectives 1989* conference here last week. "Those structures are absolutely dreadful and lousy for business in 1989."

Hammer was one of several speakers who called on IS executives to help their companies rethink their businesses to take full advantage of the strategic benefits of information technology. Hartford, Conn.-based Northeast Utilities, for example, engaged in "some nonutility thinking" to implement joint customer billing with the telephone company, according to Northeast Vice-President Tod O. Dixon.

Automation of existing divisional functions — the traditional accounting, purchasing, accounts payable and receivable — is not enough to make U.S. firms strong competitors of foreign industrial giants, Hammer said.



Hammer stressed the benefits of IS

The organization itself must change — even as automation takes over repetitive tasks within it. Ironically, perhaps, the business of redesigning the human element in the business can lead to equal gains, Hammer said.

Leading-edge technologies such as satellites, interactive video and expert systems are "paradigm-busters." These innovations can help bridge organizational barriers that prevent different functions from sharing relevant information, Hammer said. "We must redefine the nature of the work to take advantage of the systems technology," he said.

A real-world example came from Bill Dunn, executive vice-president of Dow Jones & Co., which purchased a massively parallel Thinking Machines, Inc. Connection Machine to search its huge databases.

"It solved a problem, but more importantly, it changed the mind-set of our people," Dunn said.

Hammer cited the example of Ford Motor Co., which learned several years ago that it had many hundreds of accounts payable employees while its Japanese trading partner, Mazda, had only a handful. By allowing warehouse workers to verify the receipt of ordered supplies,

Mazda was better able to leverage its investment in computers that contained order records, Hammer said. Later, Ford adopted the same approach, reducing the number of people required to handle paper receipts — and cutting costs.

That theme was echoed by Stephen K. Smith, a vice-president and computer industry analyst at Paine Webber, Inc. in New York. Productivity gains in the Far East, he said, stem as much from replacement of capital equipment in factories and lower wage rates as they do from automation itself.

"There is no 30-year-old hardware" in Asian factories, Smith said. "That's what allows them to leapfrog us with new technology."

Also challenging U.S. businesses today is the way information must be handled in relation to employees, according to Shoshana Zuboff, associate professor of organizational behavior at Harvard Business School and author of *In the Age of the Smart Machine*.

Information technology "represents a radical change in manufacturing history," Zuboff said. "Every other business change that has occurred in the past has been designed to move complexity out of the work environment," and to move important information into the hands of management.

"Now, we are giving information back to the front line" and challenging the old corporate logic in the process, she said. Learning is the new form of labor and there needs to be a shift toward much greater intellectual skills in workers, she added.

Zuboff said that although managers may possibly feel threatened at the prospect of giving up their information to the lower levels, workers want to have more and more knowledge. Managers will have to learn to play the role of educators, helping to develop skills for the front-line workers and helping to create an environment in which the skills can be expressed.

"This is the first time in history when the development of technology and the development of human skills are on the same path," Zuboff said.

To date, however, the required education is woefully short in most organizations, according to Richard Bell, a recruiter at Arthur Young Management Consulting Group in Dallas.

## A wide view

**C**hief information officers will need to look beyond their data centers if they hope to gain more respect from senior management, said Steve Zimmerman, consulting managing director of Andersen Consulting in New York.

"The CIO has to take a more proactive role in understanding the business," said Zimmerman, who consults on the design and installation of application systems at large user sites. Using a baseball analogy, he added: "I suggest that the CIO needs to step up to the plate and become actively involved in taking a position."

Zimmerman said that CIOs or information systems vice-presidents are often so involved in systems planning that they do not take time to consider the business implications of their activities. "I often ask data processing managers when they last looked at their company's quarterly report," he said. Many managers have responded that they don't often look at the financials.

However, IS budgets are rising — and often have to be justified. Staying involved with the business side should help when senior management demands explanations of multimillion-dollar mainframe purchases.

In sum, Zimmerman said that IS personnel almost have to force themselves to view things from the CEO's point of view. "The day you do that," he said, "is the day you get accepted as a player."

JEAN S. BOZMAN

**Du Pont's Mahler: Ownership is key**

New York Life Insurance Co. "You have to be proactive, do anything you can to get folks together. You have to be surreptitious about it sometimes."

Pettibone gave a broad overview of New York Life's IS strategy, but what drew the most questions from attendees was the insurance firm's Business Analyst Program [CW, Sept. 12, 1988]. The program sends senior-level IS managers to work in various business units, reporting to the business unit head but retaining strong functional ties to central corporate IS.

"The business analyst is a senior person, not a liaison," Pettibone said. "It's someone who's had a few arrows in the back."

A similar program exists at The Quaker Oats Co. in Chicago, said former Vice-President of IS Ron Brzezinski. Brzezinski, who said last week that he will be leaving the firm [see story page 119], decided several years ago that end-user applications could be written better if programmers literally moved in with the business units. Using personal computer applications to get at corporate sales data, for example, brand managers track their products more effectively.

"We had to push out applications ownership," Brzezinski said. "The autonomy of the business units was driving it."

# Sikes expected to take FCC chairmanship

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — President Bush is expected to officially nominate Alfred C. Sikes "any day now" to become chairman of the Federal Communications Commission, congressional sources said. He will be the third nomination that Bush has made to the five-member commission.



Alfred C. Sikes,  
FCC nominee

Brian R. Moir, counsel to the International Communications Association (ICA), said the user group welcomes the forthcoming nomination, although Sikes and the ICA have not always agreed on particular issues.

"Al Sikes' door has always been open to us. He has always made time to hear the views of business users, and that's the most important thing you expect out of government policymakers," Moir said.

Sikes was the top telecommunications policy adviser in the Reagan administration as head of the National Telecommunications and Information Administration (NTIA) since 1986. He is expected to continue the FCC's efforts to deregulate the telecommunications industry and, at the same time, try to repair the commission's poor relations with Congress.

At the NTIA, Sikes supported the price caps plan for regulating common-

carrier rates and urged Congress to unleash the regional Bell holding companies so they can enter the information services and equipment manufacture markets.

If confirmed by the U.S. Senate, Sikes will lead the commission at a time when its agenda includes implementing Open Network Architecture for the regional holding companies, determining whether AT&T should continue to be regulated as a dominant long-distance carrier and implementing price caps for AT&T and the local exchange carriers.

Last week, the ICA and the Ad Hoc Telecommunications Users Committee blasted the FCC's proposal to extend

price caps to the local carriers in mid-1990. They said it is unworkable, will enrich the monopoly carriers without making them operate more efficiently and will cost ratepayers about \$2 billion a year.

Bush has already nominated Sherrie Marshall and Andrew C. Barrett to fill two open seats on the commission. Marshall, a communications lawyer with the firm of Wiley, Rein & Fielding here, was director of the FCC's Office of Legislative Affairs in 1987. Barrett has been a Republican commissioner on the Illinois Commerce Commission since 1980.

Sikes will replace FCC Chairman Dennis R. Patrick, a 37-year-old Los Angeles attorney who announced in April he will resign when his successor is sworn into office [CW, April 17].

## U.S. vendors to fund chip venture

BY JEAN S. BOZMAN  
CW STAFF

SANTA CLARA, Calif. — Reacting to the dramatic Japanese lead as dynamic random-access memory (DRAM) chip suppliers, seven U.S. computer vendors agreed last week to fund a domestic start-up that produces 4M-bit DRAMs.

Semiconductor Industry Association (SIA) estimates place the Japanese market share at more than 80% of all DRAMs made worldwide. The U.S. has less than 10%, SIA said.

Now in the planning phase, the new semiconductor venture will be called U.S. Memories, Inc. Plans call for the firm to manufacture DRAM chips under license from IBM.

The seven founders — all members of the SIA board — have agreed to put up \$50,000 each to fund a business plan. The plan will be reviewed in several months by the 14-member board, which began a DRAM study group in March.

The seven vendors who contributed start-up money are Advanced Micro Devices Inc., Digital Equipment Corp., Hewlett-Packard Co., IBM, Intel Corp., LSI Logic Corp. and National Semiconductor Corp. More companies are expected to join the funding effort in coming weeks.

Sanford L. Kane, former vice-president of IBM's General Technology Division, has already been named U.S. Memories' president and chief executive officer. SIA spokesmen said the group decided to use IBM's submicron technology to produce the high-density DRAMs because it was available for volume production.

However, before the IBM technology can be used, a technology-transfer agreement between IBM and U.S. Memories must be hammered out, an SIA spokesman said.

George Bodway, director of system program planning at HP, said that the company views the compact as a long-term investment rather than an attempt to save money.

## VSAM DATA COMPRESSION

### Without the CPU Overhead

IAM REDUCES THE SIZE OF YOUR VSAM FILES BY 30 TO 70%

#### IAM'S FILE STRUCTURE — SAVES 20 TO 40%

IAM uses an advanced file structure which is far superior to VSAM. IAM's supercompressed index, freespace concepts and block sizes make much more efficient use of disk space.

#### IAM'S DATA COMPRESSION

##### SAVES AN ADDITIONAL 20 TO 50% DASD SPACE

Most files contain records with unused fields or repeating sets of characters. When IAM applies its proprietary compression techniques, the result is an additional 20 to 50% reduction in file size.

#### IAM'S CPU TIME IS DRAMATICALLY LESS THAN COMPETING

compression products. In fact, since IAM's CPU time is normally much less than VSAM, IAM with data compression takes less CPU time than normal VSAM processing.

#### TRANSPARENT

Online systems (CICS), BATCH jobs, TSO, SMP E and other applications make extensive use of key indexed VSAM (KSDS) files.

IAM is a transparent alternative to VSAM KSDS files, which substantially reduces the impact of VSAM processing in your installation. There are no modifications to programs or JCL to use IAM files in place of VSAM.

#### AUTOMATIC RELEASE OF UNUSED SPACE

IAM takes the guessing game out of VSAM space allocation. Large amounts of disk space are wasted when users overestimate how much space VSAM requires or how many records a file will contain. VSAM cannot release overallocated space.



### FREE VSAM SPACE SAVINGS ANALYSIS\*

DATA SET NAME	SPACE SAVINGS		VSAM TRKS		IAM TRKS		% SAVINGS		TOTAL RECORDS	AVERAGE LARGEST	MAX LRECL
	ALLOC	USED	STD	COMPR	STD	COMPR	STD	COMPR			
BIG.CLUSTER	37155	37155	27855	15800	25	58			4754670	233	580
CICS.FILE.MASTER	21000	19005	12720	9485	33	50			5088165	150	150
TABLE.CLUSTER										502	
NAME.ADDRESS.FILE	9315	8885	6485	1875	28	79			428529	880	2090
										2090	

The VSAM simulation report displays the current size and data characteristics of your VSAM files and how much space IAM will save you with and without data compression.

\*To see your VSAM usage, send for INNOVATION's free VSAM reporting programs.

Call for a Free No Obligation  
90 Day Trial

Supports MVS, MVS/XA and MVS/ESA

Makers of FDR and ABR

**INNOVATION**  
DATA PROCESSING

275 Paterson Avenue, Little Falls, NJ 07424 • (201) 890-7300

## NEWS SHORTS

### NAS loses court challenge

A Georgia judge last week denied National Advanced Systems' bid to bar the installation of an IBM mainframe at the State of Georgia Department of Administrative Services. NAS had charged that a crucial benchmark test was not conducted in a fair manner.

### Fujitsu offers MVS/XA look-alike

An operating system designed to be compatible with IBM MVS/XA was announced last week by Fujitsu Ltd. But IBM-compatible systems manufacturer Amdahl Corp. said the announcement is unlikely to pit Fujitsu against Amdahl, of which Fujitsu owns 46%, because Fujitsu does not sell its own mainframes in the U.S.

### Avant-Garde finds buyer

Multivendor network management pioneer Avant-Garde Computing, Inc. has agreed to be acquired by Boole & Babbage, Inc. The pact calls for Avant-Garde to file for Chapter 11 bankruptcy protection and for Boole & Babbage to assume some of Avant-Garde's liabilities and pay \$4 million in cash.

### FAA computer technicians get boost

About 2,100 air-traffic controllers and computer technicians in four cities are eligible for pay increases of up to 20% as an incentive to keep them at those locations. The five-year demonstration project is aimed at helping the Federal Aviation Administration keep staffs in the New York, Chicago, Los Angeles and San Francisco areas, where high living costs or other factors have made them unattractive work locations.

### Laptop ban gets kibosh

U.S. Transportation Secretary Samuel K. Skinner last week decided against banning laptop computers from airlines (CW, May 8). Instead, he ordered "intensive screening" of such computers before allowing them on board U.S. flights originating in Europe and the Middle East. The order responds to reports that terrorists have hidden bombs in electronic devices.

### Taiwan firms to make Sun clones

Inviting competition in the desktop reduced instruction set computing business, Sun Microsystems, Inc. announced that two Taiwan-based firms, Datatech Enterprises and Tatung Co., will make workstations based on Sun's Scalable Processor Architecture. Promising to build more than 50,000 units per month in 1990, the companies will bring computers into the U.S. through their own distribution channels.

### IBM buys into image firms

IBM acquired minority equity interests last week in applications software developer Image Business Systems Corp. and I/NET, Inc., a contract research and development firm. IBM invested \$6 million in IBS and \$4.3 million in I/NET.

### Software firms boost CSP

As expected, a number of computer-aided software engineering (CASE) vendors voiced support for IBM's Cross System Product last week. Nine vendors said they will interface their tools with CSP using CSP's external source format. One of the vendors, Business Software Technology, Inc. said it will create a version of its Endeavor change management software to automate development management for CSP users.

### Peat Marwick sells CASE tools

Seeking to transform itself into a full-service CASE vendor, XA Systems Corp. last week acquired the PMAT computer-aided software engineering tools from KPMG Peat Marwick, which will acquire a "less than 10%" share of XA Systems and will offer consulting services related to PMAT.

## Prime

FROM PAGE 1

aftermath of a meeting between executives of and attorneys for the respective companies. Neither Prime nor MAI was available for comment.

According to analysts, however, the most attractive part of the offer might well be Whitney's avowed determination to maintain Prime as a going concern in its current location.

"We are interested only in building on Prime," said Whitney partner Don E. Ackerman. "We are not, I repeat, not interested in breaking up Prime and selling off its parts."

Industry observers have been convinced from the beginning that MAI, denials notwithstanding, would plan to do precisely that if victorious.

Ackerman, who cited Prime's

customer base and its employees as major assets, said that no decisions have been reached regarding the management team. However, said Charles Foundryler, president of Daratech, Inc., a market research firm in Cambridge, Mass., "It seems clear between the lines of [Whitney's] announcement that they are expecting to keep Prime management in place."

According to industry observers, Whitney has the credentials to back up its claim that it will run Prime rather than sell it. The 43-year-old venture capital firm has been heavily invested in computer technology for many years.

If the company's proposed white-knight rescue of Prime succeeds, it will not be Whitney's first. In 1987, Whitney and fellow venture capital players Welsh, Carson, Anderson & Stowe created a subsidiary to

what it will do for us until it is tested. And I can't do that until it is finally available."

However, J. R. Garrett, manager of technological services at Fina Oil and Chemical Co. in Dallas, said that an upgraded Model 70 A-21 would offer greater potential running OS/2 and as an engineering platform than as an office machine.

IBM Entry Systems Division President James Cannavino demonstrated the plug-in replacement and upgraded a Model 70 A-21 at the product's introduction. This on-site CPU replacement is possible because of the design of the Model 70 A-21, which has a plug-in daughter card that resides on the system's planar board.

Mike Swavely, president of Compaq's North American operations, said Compaq tried a similar upgrade with its Deskpro 386.

### They tried

"We charged \$4,000, too, to upgrade the 16-MHz to a 25-MHz, and we sold much fewer than anticipated," he said. That made little impression on an IBM spokesman, who responded, "Is that our problem or theirs?"

Le Fave said the Model 70 A-21's \$1,700 price differential can be easily justified as a local-area network server, but he is concerned about the upgrade concept itself. "I tried to upgrade an AT from a 286 to a 386, and I received no performance benefits. I don't know what it will give me with these processors and a Micro Channel bus."

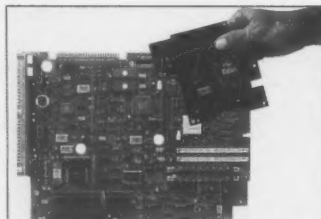
The IBM spokesman said benchmarks showed that the Model 70 A-21 outperformed Compaq's 386/33 by 40% in general-office applications.

## IBM

FROM PAGE 1

"The question is, will it be out on the market on time when we need it?" said Dick Le Fave, senior vice-president of operations and technical support at Boston Safe Deposit and Trust Co. in Boston.

IBM officials downplayed speculation that it announced the product in an attempt to



IBM's 486 plug-in daughterboard has raised some questions

freeze the high-end PC market and leapfrog Intel 80386-based PC market leader Compaq Computer Corp. with a vaporous product.

"We're telling our customers who need 486 speed and power now that the Model 70 A-21 is the platform we will upgrade first," said William McCracken, IBM vice-president of channel marketing.

"Intel has an excellent track record, and we fully expect them to meet their scheduled shipments," McCracken said.

IBM's promises do not give users a chance to see specifically what the product will do for them, said Ernie Pages, a PC consultant at Ryder Systems, Inc. in Miami.

"The performance enhancements of the i486 sound very appealing, as we need a server to support extended spreadsheets and Windows applications," Pages said. "But I don't know

**A**CCORDING TO analysts, however, the most attractive part of the offer might well be Whitney's avowed determination to maintain Prime as a going concern in its current location.

snatch Decision Industries Corp., now Decision Data, Inc., from hostile bidder Econocom International N.V.

If DR — the initials stand for the names of two Whitney partners — edges out MAI, Foundryler said, "the bad news is that Prime ends up with debt." The good news, he said, is that Prime ends up alive.

## AS/400 tape drive add-on boosts speed

BY ROSEMARY HAMILTON  
CW STAFF

IBM last week made good on one of its promises to improve its Application System/400 high-end tape drive, which has reportedly been a big disappointment to most users.

The company said it planned to make available sometime in the third quarter an add-on device designed to boost the 2440's speed to 235K byte/sec. when operating at 1,600 byte/in. and 918K byte/sec. at 6,250 byte/in.

Currently, the 2440 has data transfer rates of 120K byte/sec. and 469K byte/sec.

The add-on will cost users \$5,995.

With the enhancement, the 2440 will surpass the data transfer rates of the 3422, which was originally intended to bring relief to 2440 users. IBM originally announced the 2440 with the AS/400 last year and said that an interface to the faster 3422 would be available in the fourth quarter of 1989; IBM said it still intends to make that option available.

The 3422 has data transfer rates of 200K byte/sec. and 780K byte/sec.

All along, users have been saying that both the 2440 and 3422 were not fast enough to perform efficient tape backups.

The performance boost was one of two tape drive promises IBM made earlier this month. The company also said it plans to deliver a new tape drive in conjunction with a third-party vendor by year's end.



**Find Out Why ORACLE Is Ranked  
The Number One DBMS. Attend A Free Data  
Management Conference In Your Area.**

CONFERENCE LOCATION \_\_\_\_\_ CONFERENCE DATE \_\_\_\_\_

NAME \_\_\_\_\_

TITLE \_\_\_\_\_ PHONE \_\_\_\_\_

COMPANY \_\_\_\_\_

STREET ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

HOST COMPUTER(S) \_\_\_\_\_ OPERATING SYSTEM(S) \_\_\_\_\_

Your purchasing timeframe (check one):

☐ Up to 3 months ☐ 3 to 6 months ☐ 6 months to 1 year

- Learn about the fully relational DBMS that's compliant with ANSI, IBM SQL.
- Explore the productivity of 4GL & DSS tools.
- See portable applications run across micros, minis & mainframes
- Learn how CASE can end your application backlog.
- Integrate PCs & MACs with MIS.
- See the latest distributed financial applications.

**ORACLE®**

COMPATIBILITY • PORTABILITY • CONNECTABILITY

**Call 1-800-345-DBMS, ext. 8134 today**

**TO RECEIVE PRIORITY RESERVATIONS AT THE NEXT  
FREE CONFERENCE.**

**ORACLE®**  
Conference Invitation



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 68 BELMONT, CA

POSTAGE WILL BE PAID BY ADDRESSEE:

CONFERENCE COORDINATOR  
ORACLE CORPORATION  
20 DAVIS DRIVE  
BELMONT CA 94002



## U.S. CONFERENCES

AK Anchorage	Aug 8
AL Birmingham	Aug 16h
AR Little Rock	July 13f
AZ Phoenix	July 11
CA La Jolla	Aug 17h
Los Angeles	July 20f
Newport Beach	Aug 15w
Ontario	July 10a
Sacramento	July 27f
San Diego	July 19h
San Francisco	July 13f
San Jose	July 25
Santa Clara	Aug 24
Universal City	July 13f
CO Colorado Springs	Aug 24f
Denver	July 20 Aug 24g
CT Farmington	Aug 5f
DC Washington	Aug 17g
FL Ft. Lauderdale	July 14h
Jacksonville	Aug 9f
Melbourne	Aug 23h
Orlando	July 12f
GA Atlanta	July 19f
Savannah	Aug 10h
IA Des Moines	July 19
IL Chicago	July 19f Aug 24g
Springfield	July 11
IN Ft. Wayne	July 12
Indianapolis	Aug 18h
KS Wichita	Aug 15
KY Lexington	July 18
LA Baton Rouge	Aug 24w
New Orleans	July 27f
MA Boston	Aug 1f
Burlington	July 12a Aug 10g
MD Baltimore	July 18f
ME Portland	July 19
MI Dearborn	July 11h
Grand Rapids	July 12w
Lansing	Aug 10f
Troy	Aug 8am
MN Minneapolis	July 12h
MO Kansas City	Aug 9f
St. Louis	July 17a
NE Omaha	Aug 8f
NC Res Tri Park	July 26h
NJ Ansbury Park	Aug 8g
Iselin	July 20f July 22f
NH Albuquerque	July 20g
NY Albany	July 11f
East Syracuse	Aug 10h
Melville	July 19f Aug 16g
New York City	July 12f
Bochester	Aug 24f
OH Akron	Aug 24f
Cincinnati	July 29h
Cleveland	Aug 17w
Columbus	July 26g
OK Oklahoma City	Aug 15f
OR Tigard	Aug 21
PA Harrisburg	Aug 15
King of Prussia	Aug 15f
Philadelphia	July 6f
Pittsburgh	July 6m
RI Providence	July 11
SC Charleston	July 20h
Columbia	July 19h
Greenville	July 25h
TN Memphis	July 11f
Nashville	Aug 17f
TX Austin	July 28h
Dallas	July 11f Aug 14a
Ft. Worth	July 10h
Houston	July 15f Aug 17f
San Antonio	July 27h
UT Salt Lake City	July 25
VA Norfolk	July 11f
Richmond	July 27
WA Bellevue	July 20
WI Madison	Aug 17f
Milwaukee	July 25h

The following key indicates additional afternoon seminars that are offered with these seminar dates:

- f Oracle Financials
- g Oracle Applications Tools
- h Oracle Mail
- i Computer Integrated Manufacturing
- j On-Line Transaction Processing
- k PC Product Solutions
- l Unix

Please note:  
g These seminars are directed for the Indian Government only.  
h Only the indicated afternoon seminars are held on these dates.

## CANADIAN CONFERENCES

For registration call (800) 587-4407, except in Quebec, call (514) 337-0755.

Edmonton	July 6
Ottawa	July 5
Vancouver	July 13 Aug 10
Victoria	July 20
Winnipeg	Aug 10

## FREE: Mastering ORACLE

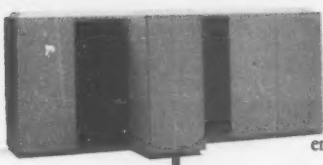
by Dan Cronin.

Pre-register for the conference by calling the 800-number on the left, mention the name of this publication and you will receive a certificate at the conference, and you a free copy of the \$24.95 book that has no-nonsense answers to today's pressing MIS and development issues.

COMP/T/000001

# Shouldn't your DBMS run on all your computers?

Cut out the section below, 3-hole punch it and save it for your next strategic planning meeting. This information could make you a hero.



**1** Mainframes running the ORACLE® RDBMS or IBM's DB2 and Oracle's SQL\*Connect™ can transparently share data with every other ORACLE system in your enterprise-wide network.



**2** ORACLE's distributed architecture makes networks and gateways invisible to your applications and to your users.

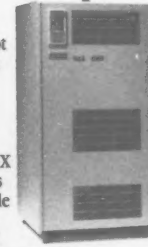


## Datacenter

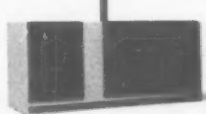
**3** VAX/VMS users specify ORACLE Version 6 more than any other RDBMS, because ORACLE is the fastest RDBMS available. And since ORACLE is optimized for the DEC/VAX architecture, you can count on mainframe-class OLTP performance when the Rigel and Ardis Symmetrical Multiprocessing (SMP) systems are introduced.



**4** For an unprecedented 3rd year in a row, ORACLE was voted the No. 1 DBMS by Digital users! Support, 4GL tools and turn-key applications are just a few of the reasons why Oracle is the largest independent hardware or software supplier to the Digital marketplace.



**5** Rdb will not run on ULTRIX. ORACLE's performance on VAX/ULTRIX systems has made Oracle the largest supplier of DBMS's in the UNIX marketplace. Oracle's commitment to supporting every major hardware and operating system is unsurpassed.



## Departmental Minis

**6** ORACLE runs on virtually all minicomputer platforms, which means your database server can be anywhere you want it, and you can move your development activity anywhere it's economical.



## Desktop End Users

**7** ORACLE is equally at home on PC's running MS-DOS, OS/2 or XENIX. Develop ORACLE applications on the desktop and deploy them anywhere in the network.

**8** ORACLE for Macintosh combines the HyperCard user interface with the most popular DBMS technology in the world. The result is unsurpassed enterprise-wide data access.

**9** ORACLE is the #1 DBMS for UNIX workstations, including the new RISC-based DECstation 3100, because only ORACLE successfully integrates UNIX technology with mainstream MIS.

**10** ORACLE is the preferred choice on the new VAXstation 3100. Use your MIPS where they count, by off-loading development from expensive datacenter and departmental computers to powerful desktop systems.

**11** Shouldn't your DBMS run on all your computers? ORACLE does. Only ORACLE can put your multi-vendor enterprise network to work. No one else can. No one else is even trying.

## ORACLE®

COMPATIBILITY • PORTABILITY • CONNECTABILITY  
Call 1-800-345-DBMS, ext. 6142 today.

Copyright © 1989 by Oracle Corporation. ORACLE is a registered trademark and SQL\*Connect is a trademark of Oracle Corporation. The other companies mentioned own numerous registered trademarks.

20 Davis Drive, Belmont, CA 94002 • World Headquarters  
(415) 598-8000 • ORACLE Canada (800) 387-4407 (except Quebec) • Quebec (514) 337-0755 • ORACLE Systems Australia 61 2 958-5080 • ORACLE Europe 44-1-948-6911 • ORACLE Systems Hong Kong 852-5-288848



# IBM gives users nudge with CICS/ESA

BY STANLEY GIBSON  
CW STAFF

IBM added another link to its chain of inducements to move customers to its flagship MVS/ESA operating system last week when it announced a version of its CICS teleprocessing monitor that takes advantage of Enterprise Systems Architecture capabilities.

Although not scheduled to be out until June 1990, CICS/ESA Version 3 Release 1 should offer a performance boost by using expanded storage instead of disks, thus reducing I/O. The new version,

which includes more functionality than other CICS versions, will not run on any operating system other than MVS/ESA.

However, CICS/MVS Version 2, the new version's predecessor, will run under ESA. IBM recommended that users of CICS/OS/VS move to that before going to Version 3. Also, IBM brought some Systems Application Architecture (SAA)-related features to CICS/ESA and promised more. However, it held back from anointing CICS/ESA as fully SAA-compliant.

"CICS/ESA Version 3 is most definitely our flagship product," said Steve Craggs, CICS/ESA launch manager in

Hursley, England. "We need to rely on ESA being there. We are specifically calling on functions available only in ESA," he said, explaining why this version of CICS will not run on other operating systems, including MVS/XA.

Some highlights of the CICS/ESA announcement included the following:

- Support for IMS/ESA's Database Manager Data Base Control, which enables customers to separate a database and its management from CICS and put it in its own MVS/ESA address space.
- Support for Data Entry Data Bases, also known as Fast Path, which provides large,

high-availability databases.

- CICS/ESA's discontinued support for CICS macro-level applications.
- Withdrawal from the market of CICS/OS/VS Version 1, which IBM had announced would not be enhanced further.

A major enhancement was to put CICS and IMS code in separate address spaces — a measure that will provide virtual storage relief by helping keep code below the 16M-byte level. Under DB2, CICS code and DB2 are already separate.

This feature should improve reliability as well, one CICS user noted. One problem that CICS has had, according to Michael Barnes, manager of computer applications at Atlantic City Electric Co. in Pleasantville, N.J., is that CICS code was not protected from other code in a single address space. A CICS crash would therefore make all data in the same address space unavailable until the problem could be fixed. Separating CICS from IMS code sidesteps this problem, Barnes said.

The added reliability that this feature promises is a plus. "Anything that brings us closer to 24-hour operations, we are in favor of," Barnes said.

Another user, similarly awaiting ESA installation, welcomed the announcement calmly. "At the present time, we don't have a requirement in that area," said Jack Mellon, director of systems development at Ryder Truck Rental in Miami.

## CICS sneaks a few inches closer to SAA

BY STANLEY GIBSON  
CW STAFF

IBM said last week that CICS/ESA Version 3 Release 1 will have more Systems Application Architecture (SAA)-related features than any other CICS version.

"The highest level of SAA support will be under CICS/ESA," said Geoff Sharman, an IBM development technical planner in Hursley, England. Other versions of CICS, including CICS/VSE, CICS/OS/2 and CICS/VM, will gain no more SAA features than they already have, IBM said.

The enhancements announced last week do not change CICS' classification as a "participating" SAA environment, which is IBM's euphemism for products that are not part of SAA but are granted some SAA attributes, including languages, protocols and interfaces. Another participating product is IMS.

Support for SAA languages Fortran and Rexx will not be offered under CICS/ESA unless users demand it. Otherwise, CICS/ESA will support all other SAA requirements, Sharman said.

The announcement said that future SAA enhancements will include support for the C language and the Common Programming Interface-Communications. IBM said it has no plans to add these or other SAA features to other CICS products, including CICS/OS/2 and CICS/VSE, but strong customer demand could change that posture, Sharman said.

For CICS to be fully SAA-compliant, support of all SAA languages would have to be offered, and CICS would have to be offered on the Application System/400.



## NO OTHER CASE TOOLS COME WITH THESE EXTRA PARTS.

At McDonnell Douglas, we understand that information is a valuable corporate asset, and to manage and maximize that asset requires not only the right tools, but the knowledge of how to use them. That's why we deliver more than just tools. We also deliver an ongoing partnership with each customer to make sure those tools work for you.

Our full life cycle tools include PRO-IV, a highly transportable development language; STRADIS, a life cycle methodology and ProKit WORKBENCH,

a software engineering tool designed for maximum productivity in applications development.

Because we understand the role of CASE in meeting your changing business and financial needs, our products and people are part of your long-term plans. We can help make the difference between efficiency and effectiveness. And that makes a difference on your bottom line.

To find out how top-line CASE thinking can affect your bottom line, call 1-800-325-1087.

**MCDONNELL DOUGLAS**

# SATISFACTION GUARANTEED

If you have been searching for a software company that can provide you with a wide range of software solutions, backed up by first rate support, we invite you to join the over 6,500 MVS, DOS and VM users who have found long term software satisfaction with SEA. Since 1982, we have been developing products based on your input and backing these products with support you can count on 7 days-a-week, 24 hours-a-day. The results have been impressive for both us and our users. With products licensed at one in every four mainframe sites worldwide, SEA software has set new standards for efficiency and performance. Our over 6,500 licensed users include 9 of the Fortune 10, 85% of the Fortune 500 and thousands of other installations of all sizes and configurations. An equally important factor in measuring our success is our high level of user satisfaction, in which we take great pride.

## SEA PRODUCT GROUPS

### Operations Automation Group

SEA provides a complete line of operations automation products covering all critical areas. We are the only company that provides such a complete line of operations automation software, backed up by first rate technical support. With over 2,500 users choosing SEA as their single source for operations automation software, we have assumed a position of leadership in the field. Many users tell us the reason they have selected our products is superior support, as well as our integrated approach to long term product development.

**ODDS** - Master Console Management.

**\$AVRS** - Sysout, Syslog and JCL Management, Viewing, Archival and Retrieval.

**TRMS** - Report Management and Distribution.

**CSAR** - Automated Job Scheduling MVS-DOS-VM.

**TRAMS** - Data Transmission Management System.

**QUICK** - Data Compression/Decompression for increased

**TRANS** data transmission between mainframes or mainframes and PC networks.

**SYNTHETIC** - Functionally verifies operating system and  
**JOBSTREAM** hardware changes before production implementation.

**KEYS** - A keyword assisted search program for software and hardware inventory management.

### Application Development Group

SEA's application development products, used at over one thousand locations, have helped increase programmer and program productivity. They aid in application development for CICS, database systems and monitor program performance and operational dependencies.

**PRO-2** - Application Development MVS-DOS.

**PROFILE** - Performance Measurement and Analysis.

### DASD/Data Management Group

SEA's DASD/Data management tools have become corporate standards, used in one out of every five MVS data centers worldwide. Our DASD management products provide dramatic savings under virtually any configuration and have set a new standard for efficiency and high performance.

*We take very seriously our claim of being able to significantly decrease DASD expenditures in any MVS configuration. Our unique approach enables us to guarantee you significant savings in both short and long-term DASD cost. Take the opportunity to trial our products with no obligation and we will provide you with the same guaranteed results achieved by over 4500 users, regardless of your installation's size or configuration.*

**PDSFAST** - High speed DASD Management,  
PDS Management, 100% IEBCOPY replacement.

**FASTGENR** - High speed replacement for IEBGENER.

**PDSUPDTE** - High speed global JCL/PDS editor.

### VSAM Group

On the average, VSAM consumes over one-third of all DASD and greatly impacts performance at many installations. SEA's VSAM products have helped many users reduce VSAM space requirements by over 25% while greatly increasing VSAM performance.

**VCF/L** - ListC replacement, VSAM tracking and reporting.

**VCF/M** - Automated VSAM optimization and allocation.

**VCF/D** - VSAM data manipulation.

**SEA also offers a complete line of products for the DEC/VAX environment including DBMS/4th GL and output queue optimization.**

SEA has products that will save budget dollars and increase efficiency, whatever your installation's size or configuration. No other software company even comes close to matching our combination of a comprehensive line of high quality software solutions, backed up by the highest levels of technical support. We invite you to join the thousands of installations who have found long term software satisfaction with SEA products.

**For further information regarding any of the above call 1-800-272-7322.**

**SEA SOFTWARE ENGINEERING OF AMERICA, INC.**  
WORLD HEADQUARTERS • 2001 Marcus Avenue, Lake Success, New York 11042  
Tel: (516) 328-7000 1-800-272-7322 Telex: 6973556 Fax: (516) 354-4015

*Products Licensed In Over 40 Countries*

# Two firms sign on for Tariff 12

BY ELISABETH HORWITT  
and MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — Allied-Signal, Inc. and another company have become the latest customers of AT&T's Tariff 12, a

controversial voice and data service.

Some users have been concerned about the legal uncertainties surrounding Tariff 12, but that worry has lessened since a Federal Communications Commission ruling in April allowed

AT&T to proceed with the service, according to Berge Ayvastian, vice-president of The Yankee Group, a Boston-based consultancy. However, rival telecommunications firms MCI Communications Corp. and U.S. Sprint Communications Co. have

filed suit in federal court seeking to overturn the FCC ruling.

AT&T filed Tariff 12 Option VI and Option VII June 16 but declined to name the first customers under each option.

Bob Norian, director of telecommunications and information systems planning at Allied-Signal in Morristown, N.J., confirmed that his firm is the customer under Tariff 12 Option VI.

He declined further comment.

The fact that Allied-Signal signed a Tariff 12 contract is not a surprise because the firm has been a loyal customer of AT&T's Software Defined Network service for a long time, Ayvastian said.

AT&T estimated that the five-year contract under Option VII — signed with an as-yet unidentified company — will be worth \$74.8 million a year, with a minimum annual charge of \$59.9 million.

Both contracts have substantial volume discounts for particular services. For example, under Option VII, the customer gets a 25% discount when committing to a minimum monthly charge of \$400,000 for 1.5M bit/sec. data transmission capability.

Meanwhile, Prudential Insurance Co. has signed an agreement but has not yet submitted what will be the largest Tariff 12 filing to date, said Henry D. Levine, a partner at Morrison & Foerster, a law firm based here.

## Opposition

MCI and U.S. Sprint recently filed suit in the federal appeals court here to overturn the FCC's decision allowing AT&T to continue offering Tariff 12.

"I don't think [the suit] is a threat to our [Tariff 12] contract, but I think it's a terrific strategy to use as a marketing tool to try and scare the devil out of telecommunications managers," said Stan Welland, manager of telecommunications at General Electric Co. "My recommendation is to do what's best for your business, because I think the suit, if not thrown out of court early on, could go on for several years."

Brian R. Moir and James S. Blaszk, Washington attorneys who work with large users, said most Tariff 12 customers have provisions built into their contracts to protect them from any legal or regulatory decisions that change the service.

The lawsuits do create some uncertainty, but user reaction will depend on how much risk particular users are willing to tolerate, Blaszk said. He said the court appeals are long-shot bids because the FCC order is sound. Furthermore, the FCC technically rejected the original Tariff 12 filings and forced revisions. In its April ruling, the FCC ordered AT&T to revise the original filings to ensure general availability, but the FCC also allowed AT&T to continue offering the service to existing customers (CW, April 17).

Don Elardo, counsel for MCI, said the FCC ignored several issues, such as the legality of AT&T offering special discounts to Tariff 12 customers but not to other customers who use the same services.

AT&T expressed confidence that the court will uphold the FCC order.

## Why ADABAS 5 is thousands of dollars faster.



The investments your organization makes in its data base technology will either cost it a fortune—or save it one. That's why you need a DBMS that assures optimum performance in a high production environment: ADABAS 5.

In a recent series of standard, fully scaled benchmarks, audited by Coopers & Lybrand, ADABAS 5 proved again that it is thousands of dollars faster. Each benchmark was conducted on a National Advanced Systems AS/EX™100 (equivalent in power to an IBM 3090 500S).

In the standardized TP1 debit-credit benchmark, ADABAS 5 worked with a data base containing 1 million accounts. The results: a record-breaking 388 transactions per second (tps)—99.3% serviced in under one second!

For the first time, an authentic ET1 debit-credit benchmark was conducted with ADABAS 5 managing 10 million accounts. The results: 167 tps (from terminal in/to terminal out)—99.5% serviced in under one second!

These figures represent major savings in time and money. But they're not surprising—at least not to the thousands of organizations which already use ADABAS 5.

They expect more performance. Plus the benefits that come from 18 years' experience in DBMS technology:—relational functionality which allows adaptable data structures and fast information retrieval based on multikey criteria—document management and free text retrieval—24 hour processing in a fully integrated DB/DC environment—portable applications across various hardware and operating systems—distributed processing—entity relationship data bases with recursive retrieval functions for knowledge-based systems.

Discover how much more profitable your DP organization can be. Conduct your own ADABAS 5 benchmark, using your own data and application profile in your own production environment. The facts will speak for themselves.

™ AS/EX is a trademark of National Advanced Systems Corporation.



**Demand the performance and functionality only ADABAS 5 can offer.**

**To order your free copy of the ADABAS 5 Benchmark Report, call toll-free:  
1-800-843-9534 today  
(In Virginia or Canada, call 703-860-5050.)**

**SOFTWARE AG**  
PROGRAMMING BUSINESS SUCCESS





# Oracle Version 6.0 covers the distributed data 'bases'

BY JEAN S. BOZMAN  
CW STAFF

NEW YORK — Oracle Corp. announced personal computer versions of its Oracle Version 6.0 last week, presenting them as one-stop shopping solutions for distributed database applications.

The company said it would ship its Oracle PC Server — which can query Oracle running on PCs, minis or mainframe hosts — for IBM's OS/2 and the Unix operating

system used on Intel Corp. 80386-based PCs.

Industry analysts said the move was an attempt by Oracle to become the first database management system vendor to offer universal, transparent query facilities. But it comes just as this market is heating up. Microsoft Corp. in Bellevue, Wash., has already teamed with Ashton-Tate Corp. in Torrance, Calif., to provide an SQL Server product for distributed PCs. IBM is reportedly expected to ship

server versions of its Database Manager in OS/2 Extended Edition packages this fall.

Timing of the PC Server announcement, therefore, was critical. Oracle is "trying to become the database standard," said Andrew M. Seybold, publisher of "Outlook on Professional Computing" in Santa Clara, Calif. "They understand that end users need to access the corporate data, no matter where it may be stored."

However, Seybold said, there was very little new technology embedded in the Oracle PC Server announcement. Instead, the first PC Server offerings are built on Oracle Version 6.0, including the Transaction Processing Option that is already shipped on mainframe and minicomputer

Oracle packages.

"We will deliver complete transparent access to host database systems, including read-only access to host systems, this summer," said Edward Oates, vice-president of Oracle's PC Products Division. Other distributed database functions will not appear until Oracle Version 7.0 is shipped in 1990.

The PC Server products, the company said, will eventually be able to access Oracle relational DBMSs running on any of 80 different hardware platforms.

Oracle's PC Database servers for OS/2, Unix 386, Banyan Systems, Inc.'s Virtual Networking Software (Vines) and Novell, Inc.'s Netware 386 operating systems will be shipped in stages, starting with the Vines version in August. The OS/2 and Unix 386 versions will be shipped next fall, while Netware 386 servers will ship in 1990.

Prices for the server software will range from \$2,500 to \$4,000.

In a related development last week, Oracle announced it would port Version 6.0 to a solid-state parallel processor made by Ncube Corp., in Beaverton, Ore. Ncube developed the first supercomputer architecture supported by Oracle.

## Major vendors eyeball X.400 API with some caution

BY ELISAEETH HORWITT  
CW STAFF

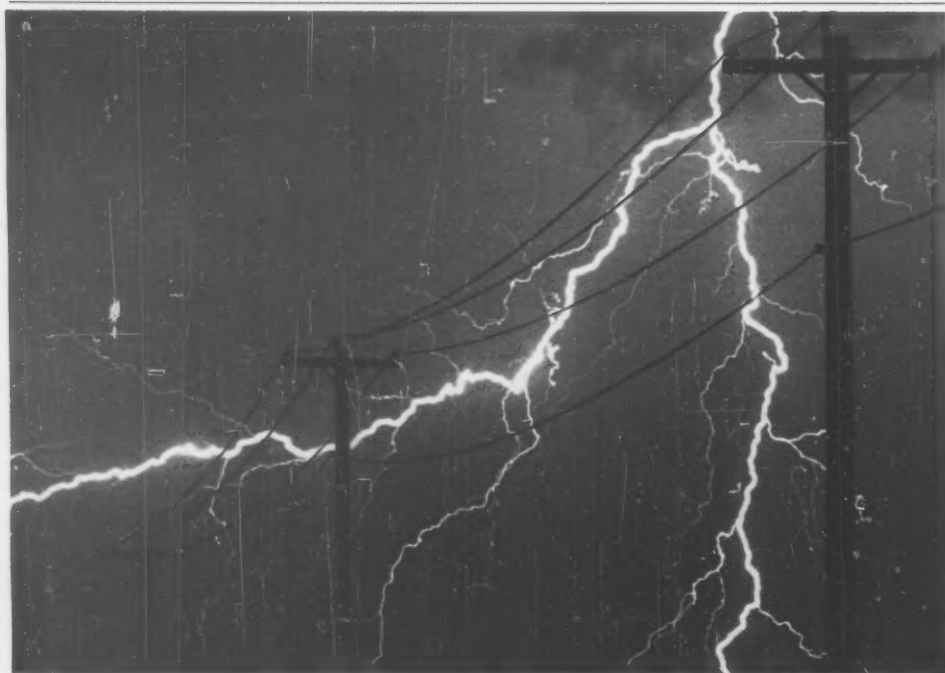
SANTA CLARA, Calif. — A group of 21 vendors last week proposed a standard application programming interface (API) designed to bring vendor independence to the gateways that enable local-area network systems to exchange messages with X.400-compliant systems. However, the absence of several major vendors raised the issue of whether the group's API will in fact become the standard, industry sources said.

The X.400 API Association published specifications last week for interfacing electronic mail packages with X.400 LAN gateways [CW, June 5]. It plans next to provide a similar link for other types of software such as spreadsheets.

Jointly founded last fall by Retix Corp. and Telenet Communications Corp., the group now includes a "who's who of office automation," said Eric Arnum, editor of the "Electronic Mail and Microsystems" newsletter. But there is some possibility of a rival camp consisting of IBM, Microsoft Corp. and Consumers Software, Inc., Arnum said.

IBM, Novell, Inc., and possibly 3Com Corp. are likely to insist on "doing things their way," said Consumers Software President Jack Grushcow. Consumers developed E-mail connections between PC-DOS systems and IBM's Officevision platform for OS/2 Extended Edition, including an API that is not the association's API, he added.

Novell intends to "seriously consider" joining the association, said President and Chief Executive Officer Ray Noorda. 3Com will release its own X.400 gateway by summer's end and is likely, but not certain, to migrate it to the association's API, a spokeswoman said.



© 1988 Hayes Microcomputer Products, Inc.

## ERROR-CONTROL FOR FORCES BEYOND YOUR CONTROL.

The hazards faced by your high-speed data can be truly shocking.

That's why, in addition to providing the original V-series™ error-control, Hayes V-series 2400 and 9600 bps modems now offer error-control in either international standard, V42 or X.25.\*

The V42 protocol, for point-to-point communications, automatically detects errors and then retransmits the data correctly. While the X.25 protocol not only offers error-control but also multisession access to value added networks with expanding applications for dial-up X.25 point-to-multipoint communications.

V-series modems still provide users with data compression that can double throughput. And Hayes AutoSync for built-in synchronous communications without the added expense of a synchronous adapter card.

All to give you more control. Because with a Hayes, the only error you can make is not buying one.



**Hayes.**

For your nearest Hayes Advanced Systems Dealer, call 800-635-1225. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348.

\*There will be a minimal charge of \$50 for either an X.25 or V42 upgrade on products purchased before October 1, 1988. Products purchased on or after October 1, 1988 will include either standard as they become available. For details call Hayes Customer Service: 404-441-1617.

100

# A major announcement from HP and Oracle

*Oracle Financials on the HP 9000 system*



If you've been struggling with timely retrieval of extraordinary financial information, there are three things you should know:

**1** HP and Oracle have joined forces to focus state of the art technology on a broad class of financial management problems, and we'd like to keep you up to date on our progress.

**2** Hewlett-Packard Company, known for outstanding product reliability, leading price/performance and top-rated customer service and support, offers you the HP 9000 Series 800. And this standards-based system can be integrated into your current environment without missing a beat.

**3** Oracle Corporation, the largest database company in the world, is offering tested, world-class financial management technology that's so easy to use, you probably won't ever read the documentation.

If you are interested in new financial management technology, HP and Oracle invite you to attend a free half-day financial management conference in a city near you.

Consider it *due diligence*.

To pre-register, call 1-800-ORACLE1, ext. 8154 today.

## ORACLE®

Copyright © 1989 by Oracle Corporation. ORACLE is a registered trademark of Oracle Corporation. TRBA

### U.S. CONFERENCES

AK	Anchorage	August 8
AL	Birmingham	August 16a
AR	Little Rock	July 13/
AZ	Phoenix	July 11
	Scottsdale	August 8/
CA	La Jolla	August 17a
	Los Angeles	July 20/8a August 15/8a
	Newport Beach	July 18a August 10a
	Ontario	July 27/
	Sacramento	July 19a
	San Diego	July 13/
	San Francisco	July 25 August 24
	Santa Clara	July 13/8a August 17/8a
	Universal City	July 6/
CO	Colorado Springs	August 24 / Aug 24a
	Denver	July 20 August 22a
CT	Farmington	August 3/
DC	Washington	July 13a August 17a
FL	Fort Lauderdale	July 14a
	Jacksonville	August 9/
	Melbourne	August 23a
	Orlando	July 12/
GA	Atlanta	July 19/
	Savannah	August 10a
IA	Des Moines	July 19
IL	Chicago	July 19/8a August 23/8a
	Springfield	July 11
IN	Fort Wayne	July 12
	Indianapolis	July 18a August 29/
KS	Wichita	August 15
KY	Lexington	July 18
LA	Baton Rouge	August 24a
	New Orleans	July 27/
MA	Boston	August 1/
	Burlington	July 12a August 10a
MD	Baltimore	July 18/
ME	Portland	July 19
MI	Dearborn	July 11a
	Grand Rapids	July 13a
	Lansing	August 10/
	Troy	August 8a
MN	Minneapolis	July 12a August 9a/
MO	Kansas City	August 5/8a
	St. Louis	July 11/8a August 8/8a
NC	Res Tri Park	July 26a
NE	Omaha	July 6a
NJ	Asbury Park	August 8/
	Iselin	July 20/ July 22/
NM	Albuquerque	July 20a
NY	Albany	July 11/
	East Syracuse	August 10a
	Melville	July 19/ August 16a
	New York City	July 12/ July 26
		August 9/ August 23a
	Rochester	August 24/
OH	Akron	August 24/
	Cincinnati	July 20/8a August 17a
	Cleveland	July 26a
	Columbus	July 5 August 15/
OK	Oklahoma City	August 2/8a
OR	Tigard	August 22
PA	Harrisburg	August 15
	King of Prussia	August 15/
	Philadelphia	July 6/
	Pittsburgh	July 6a
RI	Providence	July 11
SC	Charleston	July 20a
	Columbia	July 19a
	Greenville	July 25a
TN	Memphis	July 11/
	Nashville	August 17/
TX	Austin	July 20a
	Dallas	July 11/8a August 12a
	Ft. Worth	July 18a
	Houston	July 13/8a August 17/8a
	San Antonio	July 25/
UT	Salt Lake City	July 25
VA	Norfolk	July 11
	Richmond	July 11a
WA	Bellevue	July 20
WI	Madison	August 17/
	Milwaukee	July 25a

The following key indicates additional afternoon seminars that are offered with these seminar dates:

- a Macintosh Networking
- f Oracle Financials
- b CASE/Application Tools
- i Oracle Mail
- m Computer Integrated Manufacturing
- o On-line Transaction Processing
- p PC Product Solutions
- u Unix

Please note:

- g Seminars held for Federal Government only
- \* Only the afternoon seminar is held that day

Attn: National Seminar Coordinator  
Oracle Corporation  
20 Davis Drive  
Belmont, California 94002  
**1-800-345-DBMS, ext. 8154**

☐ My business card or letterhead is attached. Please enroll me in the **FREE** Oracle Financials seminar to be held

at: \_\_\_\_\_

on: \_\_\_\_\_

COMPUTERWORLD



**Letter Quality Faxes  
In Under 6 Seconds.**

**Video Conferencing  
For \$12 An Hour.**

**High Speed Data  
For The Price Of A Voice Call.**

**And** these are just a few of the breakthroughs made possible by US Sprint's remarkable new data service, FÖN 56.<sup>SM</sup>

For the first time ever, it lets you send data anywhere in America at 56kbps over a fiber optic voice line, without expensive private lines or access charges.

Making possible a new generation of fax machines that can send a letter quality page in less than six seconds.

Dropping the cost of video conferencing from \$300 an hour to \$12.

And cutting the cost of sending bulk data at 56kbps from over a dollar a minute to about 10 to 12 cents.

These and many more applications are made possible by US Sprint's exclusive nationwide 100% digital fiber optic network, which gives FÖN 56 a level of reliability never before possible over voice lines.

They're all available right now to US Sprint VPN<sup>SM</sup> customers, and to other business customers later this year.

To see what FÖN 56 can do for your company, call your Account Manager today. And talk with the best.



© 1989 US Sprint Communications Company Limited Partnership.  
• US Sprint is a registered trademark of US Sprint Communications Company Limited Partnership.

# Hand impairment plagues industry

BY MITCH BETTS  
CW STAFF

For some intensive computer users such as reservation agents, telephone operators and insurance claim workers, pounding the keyboard all day can lead to crippled hands.

The problem is carpal-tunnel syndrome and other painful disorders in the fingers, hands and wrists caused by repetitive key-strokes. When tendons become inflamed and swelled, they put pressure on the nerves in the wrist, resulting in shooting pains, numbness and, eventually, impaired use of the hand.

Cumulative trauma disorders may be "the industrial disease of the information age," U.S. Rep. Tom Lantos (D-Calif.) said at a June 6 congressional hearing on the topic.

Lantos said repetitive motion disorders are the leading cause of occupational illnesses — affecting workers in jobs as diverse as poultry processing and newspaper editing — and now account for one-third of all workplace injuries.

For managers, these repetitive motion injuries — also known as cumulative trauma disorders — can be a vexing problem with no easy cure as well as a costly introduction to the field of ergonomics.

At the Denver offices of US West, Inc., the regional phone company was forced by government and union complaints to spend \$2 million on European ergonomic chairs, adjustable VDT workstations, soft-touch keyboards and training videos.

The office renovation, finished in early 1988, was trig-

gered by an outbreak of repetitive motion syndrome among 189 of 500 telephone operators at the Denver offices. Many had unsuccessful operations in an attempt to relieve their pain, and 10 employees were fired be-

## Workers at risk

Employees who spend long hours at VDTs are among the workers susceptible to repetitive task injuries in these high-risk industries

- Information processing
- Manufacturing
- Retail supermarkets
- Moving and storage
- Mining
- Meatpacking
- Construction

SOURCE: NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH  
CW CHART: JOHN YORK

cause their crippled hands and arms could not keep up the pace of completing a directory-assistance call every 24 seconds.

Since the offices were remodeled, the number of repetitive motion injuries has dropped, but the problem has not disappeared. Debbie Thomas, spokesperson for US West in Englewood, Colo., said 46 operators have been diagnosed with repetitive motion syndrome since the renovation, including some people who are new employees.

"We don't know why . . . and it's extremely frustrating," she said. A joint labor-management committee has been formed to improve communication and search for answers such as changing the job design or adding rest breaks, Thomas said.

Marvin Dainoff, director of the Center for Ergonomic Research at Miami University in

Oxford, Ohio, said medical experts disagree about the role of stress in these injuries, but he added that it seems clear that working for a prolonged period in an awkward position leads to musculoskeletal problems.

"One factor [for VDT users] is how much you change your posture and what mix of tasks you have," he said, adding that redesigning jobs is as important as redesigning workstations.

Some companies regard the issue as nonsense; others are

trying to "move away from the pure assembly-line concept," Dainoff said.

Reporters and editors at more than a dozen U.S. newspapers have been particularly hard-hit, said David J. Eisen, spokesman for The Newspaper Guild. The union at *The Fresno Bee* in California said 35 of 133 employees are

afflicted.

The Communications Workers of America (CWA), which represents nearly 475,000 VDT workers, blames the problem on corporate managers who fail to give VDT users comfortable workplaces and periodic work breaks to relieve stress.

"As is frequently the case in the modern workplace, the manufacturers of VDT equipment and the companies that use them have focused on designing a device that will increase worker output but have neglected the comfort and well-being of the wage-earner who is essential to operate it," testified CWA President Morton Bahr.

Bahr noted that US West has spent roughly \$5 million so far on ergonomic offices and training, medical treatments for afflicted workers and fees for lawyers and consultants.

## Steps not taken

As labor, government and industry continue to debate causes and responsibilities for repetitive motion injuries, Lawrence J. Fine of the National Institute for Occupational Safety and Health testified recently that the problem is likely to increase. He offered two major factors for that view: First, there is a great increase in the use of computer and semiautomated technology in the service and manufacturing industries. Although the tasks are not strenuous, they tend to be more constant and repetitive. Secondly, the work force is aging. As a person ages, the body's resistance to chronic wear and tear is reduced.

In essence, work is being transferred to smaller muscle groups in the hands and fingers, according to Barbara A. Silverstein, assistant research scientist at the University of Michigan. Silverstein and other witnesses at a recent Congressional hearing criticized the federal Occupational Safety and Health Administration (OSHA) for failing to set standards on ergonomics and for having only one ergonomics expert on its staff.

"It's time that OSHA took its head out of the sand and began to draft an ergonomic standard that would cover keyboard operators," testified David J. Eisen, a spokesman for The Newspaper Guild. Meanwhile, OSHA's force of inspection and ergonomics officers should be beefed up, he added.

Alan C. McMillan, the acting head of OSHA, said the agency is greatly concerned and will "undertake a renewed, serious exploration of the standards issue" in the next two to three months. He said OSHA has given ergonomics training to its agents and has a vigorous enforcement program underway to catch violators of OSHA's general safety regulations.

While labor unions called for an OSHA standard on VDT ergonomics and strong federal enforcement, the Computer and Business Equipment Manufacturers Association (CBEMA) prefers voluntary industry action to government mandates. In a recent statement, CBEMA urged employers to provide VDT workers with properly designed workstations and training programs to ensure that workers understand how to use terminals comfortably. To that end, CBEMA recommended that managers consult the American National Standards Institute's guidelines for VDT workstation ergonomics.

MITCH BETTS

## Alleged calling-card thief charged in first-ever case

BY MICHAEL ALEXANDER  
CW STAFF

CHICAGO — Federal law enforcement officials last week charged the reputed ring leader of a nationwide network of more than 150 computer hackers with 17 counts of violating federal computer, access device and telecommunications fraud laws.

According to authorities at the U.S. attorney's office and the Chicago division of the Secret Service, Leslie Lynne Doucette, 35, was indicted for stealing telephone and computer services from companies and illegally possessing, trafficking and marketing commercial credit-card and telephone calling-card numbers, which are so-called access devices. Doucette, under the name of Kyrie, is also accused of using corporate and government voice-mail computers and private branch exchange (PBX) systems to communicate with other hackers involved in the scheme.

It is the first time that a com-

puter hacker has been arrested and indicted on charges of using voice-mail computer and PBX systems to violate federal statutes, said William Cook, assistant U.S. attorney for the Northern District of Illinois [CW, June 5].

The indictment alleged that such companies as American Express Co., AT&T, MCI Communications Corp. and U.S. Sprint Communications Co. lost "substantially more than \$1.6 million," as a result of fraud allegedly carried out by Doucette and her fellow hackers. It also alleged that Doucette directed other hackers to obtain stolen credit-card numbers that she used to obtain Western Union money orders payable to her under assumed names.

The case is expected to go to trial in about two months, Cook said. If convicted of all charges, Doucette will face a maximum sentence of 89 years in prison, a \$69,000 fine and will be ordered to pay \$1.6 million in restitution to victims of the scheme.

## Excelan, Novell find balance of labor

BY ELISABETH HORWITT  
CW STAFF

Shareholders put their stamp of approval on the Novell, Inc./Excelan, Inc. union last week, and the officially merged companies revealed plans for synergizing their product and marketing strategies.

"From Novell's standpoint, we need to accelerate technological penetration in markets we are not strong enough in," said Novell President and Chief Executive Officer Ray Noorda.

Novell, for instance, had just begun moving into Open Systems Interconnect and Transmission Control Protocol/Internet Protocol (TCP/IP) as well as Unix and Digital Equipment Corp. VAX/VMS networks, all

areas of specialization for Excelan, according to Kanwal Rekhi, former president and CEO of Excelan and now executive vice-president of Novell.

Prior to the merger, the two companies had jointly developed an Apple Computer, Inc. Macintosh version of Novell's Netware, Noorda said.

Other joint projects now in the works include the following:

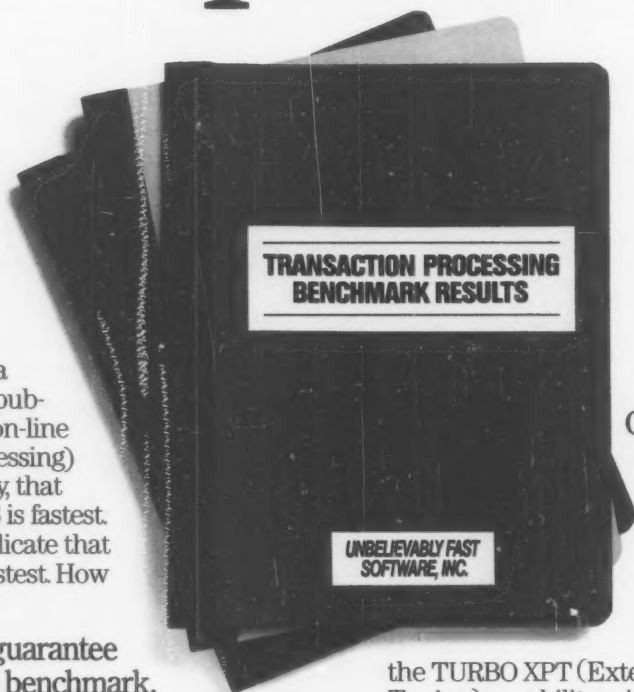
- Netware 386 versions of TCP/IP and Sun Microsystems, Inc. Network File System, which will become standard on all Netware releases beyond the 3.0 version, Rekhi said.
- OSI support for Netware at an undisclosed time.
- Portable Netware for VAX/VMS systems, tentatively set to ship by the end of 1989.

• A network management system for Netware, which will include an enhanced version of Excelan's protocol analyzer for local-area networks, the Lanalyzer.

Noorda emphasized that the merger will concentrate on LAN software, not hardware, although the partners will make sure that their products run on all of the major LAN hardware systems, including Token-Ring and Ethernet.

Excelan, which came close to merging with T1 switch vendor Network Equipment Technologies, Inc. last summer, accepted Novell's overtures because "there was a more obvious and immediate synergy between us than with NET," according to Rekhi.

# Others talk about database speed.



Every time a DBMS company publishes an OLTP (on-line transaction processing) benchmark study, that company's DBMS is fastest. Which would indicate that every DBMS is fastest. How can that be?

**A straight guarantee beats a slanted benchmark.**

The fact is, a DBMS that's fast on a benchmark may not be up to speed on your application. Unless the DBMS provides tuning capabilities that allow you to fine tune your application for maximum speed.

That's where INFORMIX-TURBO shines. And that's why we can guarantee it will run your new OLTP application faster than any other UNIX® Relational DBMS. Or we'll give you your money back.

**Fine tuning makes OLTP applications fly.**

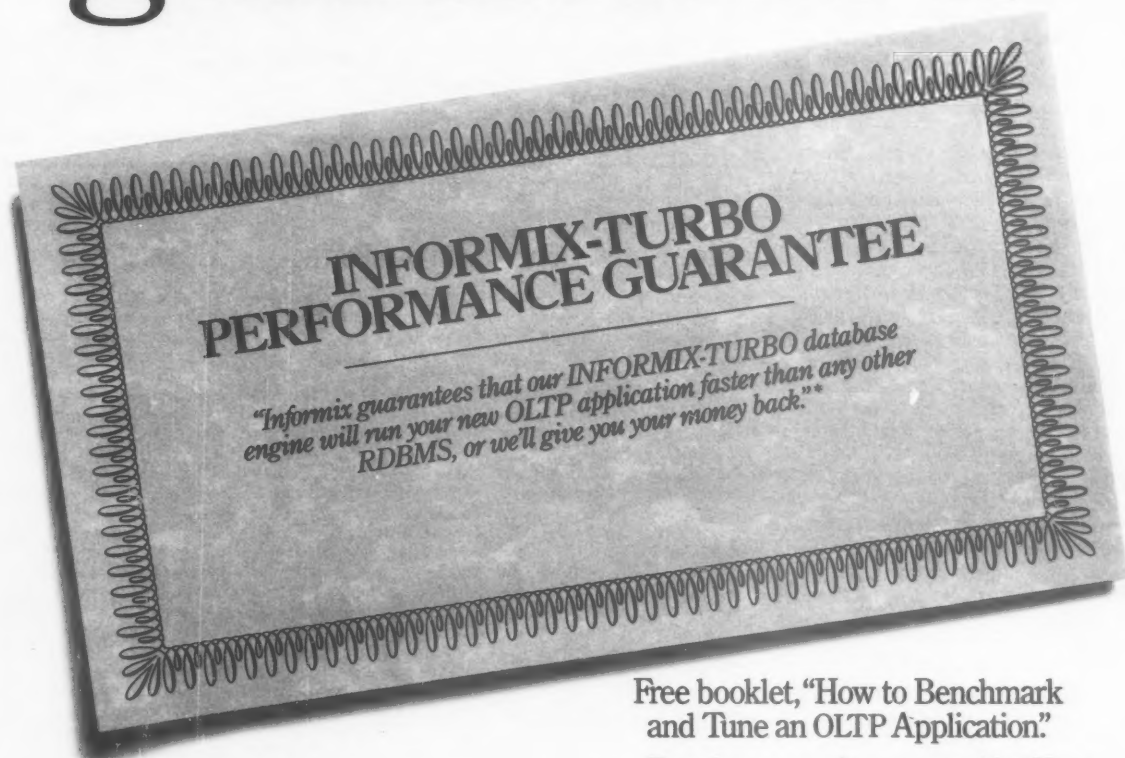
Even before tuning, INFORMIX-TURBO is fast. Its optimizer automatically provides speedy access to data.

But, frankly, it's the TURBO XPT (Extended Performance Tuning) capability within INFORMIX-TURBO that enables us to offer you this guarantee. Very simply, it provides more tuning features than any other UNIX RDBMS.

Including, for instance, more locking options than any other RDBMS. You can specify granularity, severity and duration of locks, giving you total control over how each lock affects each user, as well as overall application speed. Moreover, you can tune in even more speed by adjusting the size of your



# Only Informix guarantees it.



shared memory. Thereby avoiding time-consuming physical disk access.

## Performance tuning is easy with the right tools.

TURBO XPT includes a full-screen, menu-driven tool that lets you monitor application performance, locate bottlenecks, make precise adjustments and then observe the effects of your adjustments as your application runs.

What's more, we offer a special Turbo training course to help get you started. Plus all the on-going technical support you'll ever need.

## Free booklet, "How to Benchmark and Tune an OLTP Application."

For a free copy of our new guide, "How to Benchmark and Tune an OLTP Application," and our INFORMIX-TURBO Guarantee InfoPak containing the details and conditions of our INFORMIX-TURBO money-back guarantee, call or write Informix Software, Inc., 4100 Bohannon Drive, Menlo Park, CA 94025, 1-800-331-1763, ext. 3800. In Kansas, call 913-492-3800, ext. 3800.

And stay tuned for a fast response.



# INFORMIX

#1 for good reason.

\*Terms and conditions are included in our INFORMIX-TURBO Guarantee InfoPak.  
Informix is a registered trademark of Informix Software, Inc. UNIX is a registered trademark of AT&T. © 1989, Informix Software, Inc.

## EDITORIAL

## Heroes

*O brave new world,  
That has such people in't!*  
Shakespeare

**F**OR MOST OF us, the work day revolves around meeting budgets, fighting deadlines and pleasing the boss. Technology is a tool that cuts costs and speeds communications. When was the last time we considered whether it makes the world a better place to live?

Last week, *Computerworld* and the Smithsonian Institution recognized 11 individuals and companies that have taken technology beyond the scope of mere automation. Some are famous; many are not. All have found a use for technology that betters the human condition.

Consider LC Technologies, Inc. Its Eyegaze system bounces a beam of light off a visually impaired person's retina to enable him to type, turn on lights and dial the telephone simply by looking at a screen.

Consider the National Research Center for the Identification of Missing Children. Its computers artificially "age" photos of missing children to show how they look years later, bringing a happy ending to many families' anguish.

Consider Uplinger Enterprises. Technology enabled the Live Aid concert it produced to be seen by two billion people. It raised more than \$100 million to ease the suffering of an entire continent.

The motivations that spurred these and the other award nominees were very different. Some saw a business opportunity that, coincidentally, bettered people's lives. Others saw a chance to achieve a broader human goal with technology serving as a tool. But they all shared one thing: The things they did would not have been possible without the computer.

This is rather remarkable when you consider that only a few years ago information technology was an inhibitor of innovation. Ideas were restricted by the need to implement them on expensive, computer room-bound mainframes or minicomputers. What the physical problems could not shoot down, cost concerns usually did.

In the 1980s information technology has become the great enabler. Miniaturization has brought computing into the home, where communications makes it possible to connect to the outside world in real time. Portable video cameras send signals directly to a satellite, where they can be beamed around the world. We have only begun to exploit the potential of portable computers and embedded microprocessors. The question, "How do we make do with what we've got?" has given way to, "What new uses can we develop for this technology?"

Last week's awards were the result of what was called "The Search for New Heroes." We think we found some. We applaud the 160 nominees, the 26 distinguished judges and the 40 chairmen who gave their time and resources to this project. We look forward to finding the many more heroes who are still out there waiting to be discovered.



## LETTERS TO THE EDITOR

## Pros, cons to independent brokering

I question the direction given to would-be consultants in your article "Selecting a winning broker" [CW, May 29]. It is important to recognize that compliance to rule 1706 and other Internal Revenue Service rulings is a must, because it is the law. Undue advantage for a broker's business is often directly obtained by the use of independents who take the work without knowing they are working dishonestly.

The unknowing client may also become affected by this dishonesty in that he may ultimately become responsible for the independents' withholdings, benefits and other issues after the fact.

People seeking autonomy, career growth and personal challenge should either work for a true professional services firm or go out and start a true business. The historical "bad name" attributed to MIS consultants and contractors has been in large part propagated by brokers who have little or no stake in a quality product, the success of a project or their clients' reputation.

Let the buyer and the talented professional beware. Working with quality professional organizations is not as difficult as your story suggested. On the contrary, such organizations provide unparalleled career growth, solid compensation and limited amounts of personal and corporate risk.

**Roger Akers**  
Principal  
Prodata, Inc.  
Sacramento, Calif.

"Selecting a winning broker" confirmed, in black and white, suggestions I have verbalized to

many independent consultants over the last 10 years. It was personally rewarding to see these same opinions published in your article.

In reference to the final paragraph of this article, which mentioned a list of consulting firms willing to use independent consultants, I immediately contacted the Independent Computer Consultants Association (ICCA). Because Abator makes significant use of independent talent, the concept was of great interest. Unfortunately, the ICCA indicated no active or planned compilation of vendors willing to work with independents. Perhaps you could gain additional information from the ICCA regarding this valuable effort.

**Joanne E. Peterson**  
President  
Abator Information Services  
Pittsburgh

I want to compliment you on the excellent, informative article, "Selecting a winning broker." However, there is a major misconception in the article regarding the compilation of a list of brokers or agents.

The Independent Computer Consultants Association (ICCA) does not in any way compile, maintain or distribute such lists. Many, if not all, of the local ICCA chapters publish directories of their members who are independent consultants.

Any individual, company or organization may contact a local chapter of the ICCA for information on obtaining copies of these directories.

**Robert B. Slobins**  
President  
Informatics International, Inc.  
Fort Lee, N.J.

## Real maintenance

The letter that decried the practice of maintenance fees charged for software products [CW, April 17] compares software maintenance and a car's warranty. Unfortunately, software developers are all too human and defects are present in purchased software. But error correction is only part of the maintenance story.

When you buy a car and then change your driving habits, do you expect the car manufacturer to retrofit four-wheel drive and heavy-duty shocks into the vehicle? No, but you do expect the software manufacturer to upgrade his product when you change operating system releases on your computer.

If you drive your vehicle into a lake, do you blame the manufacturer for failing to make the engine watertight? No, but you do fault the software producer for failure to edit against all possible bogus input.

Software is not the only thing on the market that contains defects at the time of purchase — my vacuum cleaner was recalled two years ago. Unlike cars, or vacuum cleaners, software is an evolving thing that is constantly being improved over time, and software maintenance dollars are the engine that drives this improvement process.

**David W. Dick**  
Software Developer  
Davis, Thomas & Associates  
Minneapolis

*Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

## Tracking technology: Who performs the task?

JOHN KIRKLEY



For today's harried IS manager, keeping up with technological change is becoming an increasingly difficult job.

Tracking new product introductions and major enhancements is tough enough, but the well-informed IS manager's homework does not stop there. He must also keep abreast of the infighting and political maneuvering engaged in by vendors, standards bodies and government agencies that often have more of an impact on technology's future direction than a revolutionary piece of hardware or software.

One way businesses have chosen to deal with this information overload is to set up in-house technology-assessment groups. The primary role of these groups is to intelligently analyze massive amounts of available information, perceptively sniff the winds of change and make recommendations as to which technological track the company should follow.

Obviously, this is a key function. Today, incorrect technological recommendations that are based on bad information or inaccurate judgments can be disastrous.

A survey of 38 Fortune 1,000 companies conducted last year by Forrester Research, a Cambridge, Mass., consulting firm, found that nearly half of the companies contacted had set up in-house technology-assessment groups that functioned independently from the MIS and telecommunications departments.

### First impression

At first glance, establishing a separate group seems to have several distinct advantages.

An independent group theoretically will not have a vested interest in a particular vendor or technology. The group's judgments as to what technological directions the company should take will be based on what is good for the company, not what is most convenient for IS.

Furthermore, many IS managers are just too overloaded to do a thorough job of keeping track of what is happening. Most have only enough time to skim a few trade journals and attend one or two conferences a year; the rest of their working days are filled with "firefighting" and

seemingly endless meetings.

An independent organization, whose only charge is to assess the technology, will obviously do a more thorough job.

There is also another inescapable fact of corporate life: political infighting. If the IS department has the technology-assessment charter, even the most impartial IS manager will be hard-pressed not to make recommendations that would ensure the continuity of his department and his job. Telecom managers cannot be expected to roll over and play dead. Turf wars are inevitable.

So an independent technology-assessment group is the way to go... right? Wrong.

Here's a scenario proposed by Larry Woods, the director of research at John Deere Information Systems:

"The technology-assessment group gets fixated on the wonders of new laptop technology and passes the information on to a senior vice-president," Woods says. "The senior vice-president is knocked out by the possibilities offered by a 40M-byte, four-pound Toshiba running Unix, Lotus and Dbase. He tells the president about it over lunch, and they decide to issue the new hardware to all the field sites. The IS manager finally learns about the plan at a point where his objections would make him appear to be a myopic reactionary. The laptop computers are purchased and issued, and before long, the IS manager is getting calls from field managers at 100 different sites who want to hook into the mainframe to update massive files and swap data. The nightmare begins."

Unless the IS manager has a fixed bias for or against a particular vendor (usually IBM), the assessment of information technology and recommendations to top management should reside in the IS department.

There will always be new and seductive technology on the market. The real issue is not what's new and hot. Rather, it is how to manage the new technology, and how to make it work within the strategic directions set for the business. The IS manager should be the most qualified individual in the company to assess the impact of new systems on the existing structure. He should also be able to assess how well the technology fits the organization's long-range plans.

When it comes to technology, IS managers will do well to heed one of the dictums set forth by Jack Welch, chief executive officer at General Electric: "Control your own destiny, or someone else will."

Kirkley is a computer industry writer, editor and consultant based in Warwick, N.Y.

## Trapping those computer gaps

JOHN BARNES



I've heard a lot in the last two years about the "software gap." The gap is between machine and program. Dramatic improvements in hardware have not been matched or taken advantage of by advances in software. But that is only the conspicuous gap. There are at least four other gaps in the industry:

• **The software design gap.** Programmers can turn out a program quickly from a good specification. However, specification writers and systems analysts can't design fast enough to keep programmers fully occupied. One effect of this is that inadequately designed products move through the cycle too fast; hence, there are a number of atrocious, bug-ridden, apparently purposeless products on the market.

• **The documentation gap.** New programs are coming into the marketplace much faster than good manuals and tutorials can be written for them. A majority of new products probably have documentation that is inadequate for the user's purposes. The most obvious example is that the publishing industry makes money producing competing manuals, and users will pay \$25 or more for books with information that was supposedly included in the software package's free manual.

• **The support gap.** Even when the program does come out with decent directions on how to use it, it's very likely to rot on the shelves because its potential buyers — who are often not the potential users — don't know it is there or what it is good for. Or the salespeople haven't been told enough to know how to inform those buyers.

• **The concept-communication gap.** The introduction of truly innovative software into any shop changes the entire operation of the business, yet it is such change that is seldom planned for and almost never explained to the people who will be

Barnes is northwest area manager of ADG, a high-tech marketing company based in San Pedro, Calif.

living through, working with and implementing the change.

Automating a process doesn't just make it go faster; it changes its nature fundamentally. The spreadsheet is changing calculation far more than the adding machine, slide rule or pocket calculator did.

But does anyone sit down to figure out what changes will happen, or ought to happen, when processes are computerized — let alone explain or discuss those changes with the people affected? As a result, it is often literally years before a shop figures out how to really work with new software.

I see a pattern in all this. The



CHRISTOPHER BING

more a process involves human beings, the bigger the gap. Hardware hardly involves people at all. Software has a human interface, and it is developed much more slowly. Design requires people to talk to each other, so it goes even slower. Documentation and communication are entirely human-to-human activities and virtually take forever.

### Simple question

Now why should this be? After all, people are far better at interpreting vague signals than machines are. Furthermore, a lot more people can write than program, and for that matter, there are many more people who can program than there are people who can design chips. So why do we do so badly at something we should be good at?

One obvious answer is: Who says we're good at communicating? Given the number of wars, court cases and divorces human beings produce, maybe it's silly to think we're all that good at communication anyway.

So do we just have to live with

the computer industry gap forever? I don't believe it.

The most common reason for communication to fail is that someone is trying to communicate information that he doesn't have. In hierarchies, it's extremely easy for anyone in a position of power to say to a subordinate: "Do this."

If the subordinate then says, "Do what, exactly?" the most natural response (because it takes the least effort) is: "Don't bother me with details. I shouldn't have to do your thinking for you."

At which point the subordinate goes off, makes a few guesses and issues some more vague directives. By the time the matter reaches the person who really must do something, the accumulated weight of unmade decisions is terrifying.

The camel was not a horse designed by a committee. If it had been, the committee would have had to argue and reach some decisions. The camel was undoubtedly designed by some staffer at 3 o'clock in the morning after the committee voted that they wanted an animal to carry people, wrote a single-page document called "The Horse: A People-Carrying Animal Whose Time Has Come — Objectives, Goals and Policies" and then went home early.

This is why the problem is so acute in matters dealing with computers. IS is nothing but an accumulated set of decisions and policies. So when the decisions are unmade or vague, the work of the computer professionals, particularly software writers, will be inadequate.

### Familiar cure

The cure for this, like the cure for most problems that won't go away, is simple — and painful. People have to demand real, thoughtful decisions from one another.

What are we writing a program to do? What problems will it solve, and not solve? How do we want a retail salesperson in Dubuque, Iowa, on his first day on the job, to present this to a customer? What must our users understand before they can use this?

The days of "when in doubt, mumble," are over. Or to be more precise, if the computer industry wants to close its many gaps, those days must come to an end.



# Software AG has the solution ...



MACKE, AUGUST, Fashion Shop, 1913. Photo: State Museum Westphalia for Art and Cultural History, Münster

## Business needs to take advantage of changing market needs.

Directions in hardware technology have a habit of changing with every product release, trade fair or DP cover story. That's one reason why your organization should profit from the benefits of powerful, portable system software technology designed to take advantage of change. Without jeopardizing investments in already acquired applications or hardware.

ISA - The open Integrated Software Architecture - from Software AG is just what you need to be your best. The comprehensive products it supports are portable. Even across hardware systems (IBM, DEC, Siemens and WANG).

They're open. Ready to adopt new ideas and technologies, without disrupting performance. They're fully integrated. And they're powerful, capable of providing the fast, effective solu-

tions required in today's high-volume, multi-computer environments.

With ISA, all you need to integrate 4th generation applications, true end-user computing, relational-oriented data management, a universal office system and the transparent distribution of data and processes is at your command.

And, with more than 80 offices in over 55 countries, Software AG not only provides outstanding products. It provides outstanding service. Call toll-free for more information: 1-800-843-9534 (In Virginia or Canada call 703-860-5050).

**SOFTWARE AG**  
PROGRAMMING BUSINESS SUCCESS

# SYSTEMS & SOFTWARE

## SOFT TALK

Bohdan Szuprowicz

### In search of real Help

There are Help desks and there are Help desks. When they are automated by turning them into specialized expert systems, the results can be spectacular successes or dismal failures. Much depends on the type of desk being made expert and its impact on the corporation's business.

The expert system Help desks we hear about most often represent attempts to automate the various trouble-shooting functions of a computer center. These are designed primarily to assist end users in starting up a computer-related task or getting out of some loop that hangs them up.

Such expert system Help desks can take the form of software hot lines, personal computer configurators, system tuners, network analyzers and trouble-shooters, dump analyzers or system debuggers. These Help desks represent many critical functions that most IS staffs must always be prepared to carry out at a moment's notice.

However, it is highly questionable whether such Help desks can be considered strategic expert system applications. Most are unlikely to noticeably affect the competitiveness of the company.

*Continued on page 31*

## Word from the AS/400 front: Caution

### ANALYSIS

BY ROSEMARY HAMILTON  
CW STAFF

System/36 users now considering an Application System/400 should heed the advice of IBM customers who are by now war-weary AS/400 veterans. Put simply, they say: Be careful.

Most would recommend a purchase but would also tell new users to go slowly and not to expect the nontechnical person's system that the AS/400 once seemed to be. In other words, the image of Alan Alda promoting the AS/400 in a friendly office environment is one that is best forgotten.

"My bottom-line recommendation is that the yellow light is on. Proceed with caution," said Jared Whittemore, president of

J&H Software, Inc. in Denver, which uses an AS/400 B10. "Don't expect it to be as smooth as the System/34-to-36 [conversion] was."

Whittemore, who does consulting and software development for IBM's midrange platform, said his company's migration from a System/36 was far more troublesome than he had expected.

"Even IBM indicates that someone with programming knowledge is needed. That is really important," Whittemore said. Even with in-house expertise, though, Whittemore said he thought that "the migration process could be improved upon."

The good news for new users, however, is that IBM has apparently listened to the complaints of early users.

"IBM's interest in us has

been beyond what we imagined a year ago," said Ron Cipolla, MIS director at Kendall Co. in Boston. "They're constantly asking us about what's good and what's bad, and we can actually see what's being done with that input."

### IBM used feedback

An IBM spokesman said feedback from customers and third-party software developers will be incorporated in both IBM support services and future product enhancements. Included in last week's announcements from IBM were "usability enhancements" for the AS/400.

In the meantime, the company is busy cloning the migration assistance program that it currently operates out of Rochester, Minn. By summer's end, IBM expects to have 12 migration assistance centers set up around the country and staffed with Rochester people.

Separately, IBM has beefed up its training of business partners, the companies that write applications for the AS/400. A relatively new program called Jumpstart is under way in Rochester that will give business partners more training on the mid-range environment.

Of course, some users could say they wished all these additional programs were offered in late 1988 when their AS/400s were arriving and their headaches were beginning.

What they got instead was help from IBM on a per-problem basis.

"When we brought our code over to operate in System/36

mode on the AS/400, it was a nightmare," said Phyllis Bordeaux, data processing manager for the information systems department in Orange County, Texas. "Nothing worked. We had so many problems that we were loading between 10 and 12 PTFs [Program Temporary Fixes] per day. And after we got all that working, we had problems with performance."

At this point, according to Bordeaux, IBM stepped in and made modifications to the code. Once those modifications were made, the performance picked up dramatically, she said.

Frank Campbell, IS director at Jefferson Regional Medical Center in Pine Bluff, Ark., said he got help early on from IBM, particularly with software problems. Over time, he said, IBM itself seems to have learned more about the AS/400 software and is improving its support, Campbell said.

"In a way, it was a new project for them, and they had their own bugs to work out," Campbell said. "They're much more responsive now."

*Mid-Atlantic Correspondent Robert Moran contributed to this report.*

### Data View

#### Software market forecast

Through 1993, mainframe, mini and micro software markets are projected to see average annual growth of 13%, 16% and 30%, respectively

#### USER EXPENDITURES IN BILLIONS

'88 Mainframe	\$10.3
'93 Mainframe	\$18.9
'88 Mini	\$8.2
'93 Mini	\$17.2
'88 Micro	\$6.6
'93 Micro	\$25

SOURCE: INPUT

CW CHART: JOHN YORK

### Inside

- Mom-and-pop shops stock up on Associated Grocers' IS services. Page 25.
- CA's transparency products smooth way for relational transitions. Page 25.
- Big Muddy watchers employ Prime 9955. Page 25.



## PLATINUM Database Analyzer™ for DB2

### PROBLEM - Managing physical DB2 objects

One of the problems confronting you, the DBA, is managing the physical DB2 objects within your DB2 system(s). To maintain an efficient system, you must tune the object's definition, monitor the space usage and growth of the objects, and verify the integrity of the objects.

DB2 does not provide the facilities necessary to perform effective management of your DB2 physical objects. DB2 does not maintain sufficient space statistics or space usage history, provide update activity and freespace usage information, or provide a mechanism for verifying the integrity of DB2 objects and easily correcting problems when they occur. DB2 leaves those tasks to you.

### SOLUTION - PLATINUM Database Analyzer

PDA is a DB2 DASD and database monitoring, analysis, verification, and tuning tool. It provides you with all the necessary tools to manage physical DB2 objects.

PDA is the most comprehensive set of tools available for managing DB2 objects, all in one package, all from one vendor.

Call for more information or a FREE PRODUCT EVALUATION.



1-800-442-6861

PLATINUM technology, inc.  
The DB2 Company™

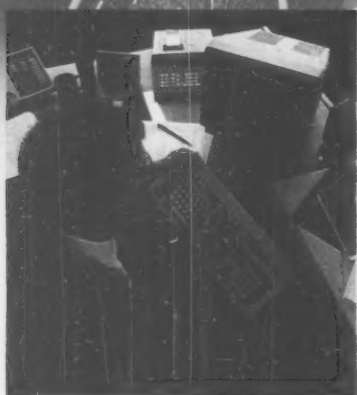


THE DB2 DATABASE WATCHDOG

555 WatersEdge Drive

Lombard, IL 60148

(312) 620-5000



## 1st Nationwide banks on NOMAD to deliver better banking across America.

No matter where you take to the open road, banking with 1st Nationwide is as convenient in New York and California as it is in your hometown.

With aggressive expansion to more than 250 branches and access to 25,000 ATMs coast-to-coast, 1st Nationwide is well on the way to becoming THE bank for middle America.

1st Nationwide recognized early on that effective information systems hold the key to sustained growth. And under the steady hand of CIO Tor Folkedal, their systems were completely overhauled. Converting to new hardware. Installing new systems to improve ATM performance. And giving the bank's line managers immediate access to the production data needed to make sound business decisions.

This is what NOMAD does best. And why NOMAD was chosen as a critical component in their ambitious plans.

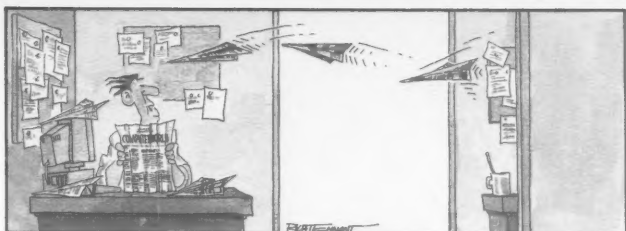
NOMAD's advanced relational technology, reporting flexibility and sophisticated, integrated decision support tools are but a few of the reasons why its use has spread throughout the bank. Today, business managers in virtually every functional area of the bank use NOMAD to analyze the impact of their decisions. Whether on a current loan portfolio, savings program or advertising campaign.

Integrated technology is central to 1st Nationwide's information management strategy. Our commitment to NOMAD's ongoing enhancement and integration across multiple platforms provides 1st Nationwide with an asset that's like money in the bank.

To learn more about 1st Nationwide's use of NOMAD, or for a demonstration that illustrates NOMAD's partnership role at companies like yours, call 1-800-441-MUST.

**MUST** SOFTWARE  
INTERNATIONAL  
Making 4GL a language anyone can speak.





"YOU KNOW, WHEN I ASKED TO BORROW YOUR COMPUTERWORLD, I SORT OF HOPED I'D GET THE WHOLE THING AT ONCE."

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$44.00\* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

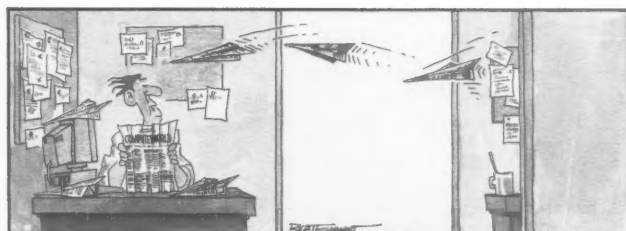
First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
 Title \_\_\_\_\_ Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year  
 \*U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

# COMPUTERWORLD

E4926-6



"YOU KNOW, WHEN I ASKED TO BORROW YOUR COMPUTERWORLD, I SORT OF HOPED I'D GET THE WHOLE THING AT ONCE."

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$44.00\* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
 Title \_\_\_\_\_ Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year  
 \*U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

# COMPUTERWORLD

1. BUSINESS/INDUSTRY (Circle one)  
 10. Manufacturer (other than computer)  
 20. Finance/Insurance/Real Estate  
 30. Medicine/Law/Education  
 40. Wholesale/Retail/Trade  
 50. Business Service (except DP)  
 60. Government — State/Federal/Local  
 65. Communications Systems/Public Utilities/Transportation  
 70. Mining/Construction/Petroleum/Refining/Agric  
 80. Manufacturer of Computers, Computer-Related Systems or Peripherals  
 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting  
 90. Computer/Peripheral Dealer/Distributor/Retailer  
 95. User/Other \_\_\_\_\_  
 (Please specify)

2. TITLE/FUNCTION (Circle one)  
 10. PRESIDENT/OWNER/GENERAL MGR  
 11. Vice President/Asst VP  
 21. Dir. Mgr. Suprv. IS/MS/DP Services  
 22. Dir. Mgr. Suprv. of Operations, Planning, Adm. Services  
 23. Dir. Mgr. Suprv. Analyst of Systems  
 31. Dir. Mgr. Suprv. of Programming  
 32. Programmer/Methods Analyst  
 35. Dir. Mgr. Suprv. QA/QWP  
 36. Data Comm. Network/Systems Mgt

- OTHER COMPANY MANAGEMENT  
 11. President, Owner/Partner, General Mgr  
 12. Vice President/Asst VP  
 13. Treasurer/Controller/Financial Officer  
 41. Engineering, Scientific, R&D, Tech. Mgt  
 51. Sales/Mktg. Mgt

- OTHER PROFESSIONALS  
 60. Consulting Mgt  
 70. Medical, Legal, Accounting Mgt  
 80. Educators, Journalists, Librarians, Students  
 90. Others \_\_\_\_\_  
 (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant:  
 A. Mainframes/Supremes  
 B. Minicomputers/Small Business Computers  
 C. Microcomputers/Desktops  
 D. Communications Systems  
 E. Office Automation Systems  
 F. No Computer Involvement

1. BUSINESS/INDUSTRY (Circle one)  
 10. Manufacturer (other than computer)  
 20. Finance/Insurance/Real Estate  
 30. Medicine/Law/Education  
 40. Wholesale/Retail/Trade  
 50. Business Service (except DP)  
 60. Government — State/Federal/Local  
 65. Communications Systems/Public Utilities/Transportation  
 70. Mining/Construction/Petroleum/Refining/Agric  
 80. Manufacturer of Computers, Computer-Related Systems or Peripherals  
 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting  
 90. Computer/Peripheral Dealer/Distributor/Retailer  
 95. User/Other \_\_\_\_\_  
 (Please specify)

2. TITLE/FUNCTION (Circle one)  
 10. PRESIDENT/OWNER/GENERAL MGR  
 11. Vice President/Asst VP  
 21. Dir. Mgr. Suprv. IS/MS/DP Services  
 22. Dir. Mgr. Suprv. of Operations, Planning, Adm. Services  
 23. Dir. Mgr. Suprv. Analyst of Systems  
 31. Dir. Mgr. Suprv. of Programming  
 32. Programmer/Methods Analyst  
 35. Dir. Mgr. Suprv. QA/QWP  
 36. Data Comm. Network/Systems Mgt

- OTHER COMPANY MANAGEMENT  
 11. President, Owner/Partner, General Mgr  
 12. Vice President/Asst VP  
 13. Treasurer/Controller/Financial Officer  
 41. Engineering, Scientific, R&D, Tech. Mgt  
 51. Sales/Mktg. Mgt

- OTHER PROFESSIONALS  
 60. Consulting Mgt  
 70. Medical, Legal, Accounting Mgt  
 80. Educators, Journalists, Librarians, Students  
 90. Others \_\_\_\_\_  
 (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant:  
 A. Mainframes/Supremes  
 B. Minicomputers/Small Business Computers  
 C. Microcomputers/Desktops  
 D. Communications Systems  
 E. Office Automation Systems  
 F. No Computer Involvement

E4926-6



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

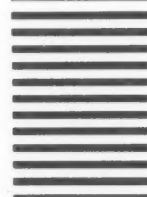
POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

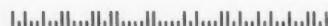


**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



# Small stores use association's IS leverage

## ON SITE

BY J. A. SAVAGE  
CW STAFF

SEATTLE — Established during the Depression to help small mom-and-pop grocers compete with chain stores, Associated Grocers, Inc.'s main role is still to buy and distribute wholesale stocks. However, information systems is gaining an important role as small and independent stores leverage their ability to compete by subscribing to an increasing variety of information services from the cooperative.

"We take advantage of the economies of scale to hire staff to develop software and new services," said Richard Lester, vice-president of information services. "We don't offer information services to make a profit but to make our members more successful. We aim to keep the cost of services out of the cost of the product."

### Big and small

The 350 member stores range in size from corner markets to superstores. While primarily serving the Pacific Northwest, Associated Grocers just added a new market in Guam, Lester said.

"A typical supermarket has 25,000 items. If you want to keep data on those, you have huge volumes of data and you can't store that on a PC," Lester said.

Stores might subscribe to a menu type of service-offering such as "customer composite," which keeps track of all the items in a given store, their profit margins, their back inventory, how often they sell and whether sales are seasonal.

"We can keep a pattern on them and find the profitability at



Associated Grocers' Lester aims for successful members

any given time," Lester said. PCs in the individual stores act as terminals to Associated Grocers' two National Advanced Systems Corp. AS/XL 60 mainframes and download information for individual analysis.

Other services include computer-aided design (CAD) for designing new or remodeled stores and bar code scanner information, compilation and financial services.

Although IS is still a relatively minor service offered by Associated Grocers, with about 25% of its employees dedicated to information services, management takes a strong interest in development, according to Lester. "The past two presidents of the organizations have accepted the theory that investment in data processing is like compound interest — small investments over time add value," he said.

### New ownership

As a NAS user, Lester said he is not at all concerned about the company's recent sale to Hitachi Ltd. and Electronic Data Systems Corp. NAS, it seems, can do little wrong by Lester since he turned to the vendor in late 1987. Associated Grocers had been an IBM shop since he first started with the company at age 18 and dealt with a 1401.

The company had obtained a 3090 Model 200 and was running VM/XA for both development and production.

"In the early days of VM/XA, if something happened to a disk drive, you had to take the whole system down, and IBM couldn't come up with a solution," Lester said. He said he had set the budget at a certain level and anticipated that the 3090 could handle three years of growth. But he soon found it was not enough.

To get around budget constraints, he leased out the IBM mainframe and got the two NAS

machines. He used two CPUs to separate production and development functions.

He does not castigate IBM for selling him the wrong CPU, but unfortunately, it was wrong. "We had a difference of opinion about how the systems should support us day to day," Lester said.

Lester is much more concerned with software vendors, particularly Computer Associates International, Inc. The beef is not with technical prob-

lems, but Lester said he is forced to use CA's products because there is no alternative in some areas and thus he may be forced into the company's proposed tiered pricing structure.

"It's a business policy, CA has taken the heat for following IBM down the tiered pricing road," Lester said. "Perhaps there is a legal contract [between software vendor and user], but the moral contract has been breached." A core problem is that there is no competition in some areas. "If that continues, this industry is in for real headaches. We can't count on the federal government to save us," Lester said.

## CA's transparency tools allow smooth transition

BY STANLEY GIBSON  
CW STAFF

Moving from a nonrelational to a relational database management system can be full of friction, but some users are finding that Computer Associates International, Inc.'s transparency products grease the skids.

The software giant has several products that bring data in nonrelational formats, including IBM's VSAM and IMS and Cincom Systems, Inc.'s Total, to CA's Datacom/DB structures. The transparency products and Datacom/DB were developed by Applied Data Research, Inc. (ADR), which CA acquired last year.

sion for Datacom. The transition was not entirely smooth, however. "We had a few problems, but worked with ADR to resolve those," Barnett said.

Eleanor Kring, who was involved in the project as a database analyst at Welch's and is now a professor of computer science at the State University of New York in Fredonia, complained of a variety of problems in the conversion, including a number of bugs found in the transparency software itself.

As part of the conversion procedure, Kring had to run all of Welch's programs under both the DL/I and transparency databases, ensuring the results were the same. In the process, she said, numerous bugs were found.

Although CA sent out patches to correct them, there was considerable annoyance and time lost in discovering the bugs and fixing them. Kring said that given the number of difficulties associated with the transparency, she would urge other users to avoid it, except in very simple DL/I or VSAM installations.

### On the contrary

Barnett acknowledged there had been some problems, but he disagreed with Kring's bottom-line assessment. He claimed that using the transparency saved half the money that would have been spent otherwise in rewriting everything. He said the testing that Kring performed with the transparency would also have been required were everything to be rewritten.

Another user, Bruce Conforto, director of information services at American Olean Tile Co. in Lansdale, Pa., was enthusiastic about CA's product.

"If you were moving from any database, including VSAM, to anything else, then Datacom, with its transparencies, is the obvious choice," Conforto said. "Our goal would be to try to

Continued on page 27

## Sitting on the dock of the bay . . .

BY ELLIS BOOKER  
CW STAFF

ONALASKA, Wis. — A Prime Computer, Inc. 9955 Model 2 here is filling up with data about the health of the upper Mississippi River system as part of a project headed by the U.S. Fish and Wildlife Agency.

Part of the 1987 Environmental Management Program, the so-called long-term resource monitoring program, is collecting trend data on sedimentation, water-level fluctuation and navigation in the five states of Minnesota, Wisconsin, Missouri, Iowa and Illinois.

"We have three field stations now transmitting data to the Prime on a monthly basis," explained Joe Wlosinski, assistant program manager at the Environmental Management Technical Center here. He added that six stations are planned, each operated by state environmental officials, and that the scope of the field reports will be ex-

panded this year to include vegetation, fish, invertebrates, birds and mammals. Public river use will also be included in field reports this year. The Prime system, set up in December, was chosen because it ran Arcinfo, a Geographic Information Systems (GIS) vector graphics and da-



FRANK C. O'CONNELL

tabase package from the Environmental Systems Research Institute in Redlands, Calif., and because the U.S. Department of the Interior had a prior contract with the firm.

In addition to using Arcinfo, Wlosinski said, his 15-person center is mapping the river and surrounding land using two

raster graphics programs from the Land Management Information Center of Minnesota.


However, Wlosinski said, due to limitations in the database management system portion of Arcinfo for non-GIS applications, a new DBMS for the Prime — likely to be Oracle from Oracle Corp. — is being evaluated.

Field agents now record data from different sites along the river with manual instruments. This information is later input, along with comments, into a personal computer running Microrim, Inc.'s Rbase at the field station. Each month this data is sent on floppies to Onalaska, but a programmer was recently hired to design a scheme for using modems to upload the data.

For now, field agents can only download data to the Prime minicomputer. The long-term plan is to allow the remote centers and other federal and state agencies to dial in and retrieve the data.



# Everything OS/2 can do for you...



OS/2™ includes a built-in graphical interface so it's easy to use.

OS/2 lets you run your DOS programs plus hundreds of programs DOS can't.

OS/2 lets you run programs larger than 640K, so you can use more powerful applications.

OS/2 lets you take full advantage of Micro Channel.™

OS/2 provides an optional Communications Manager which allows easy networking.

OS/2 lets you keep two or more programs running at the same time, so you can do more.

OS/2 lets you take advantage of 386™ power.

OS/2 provides an optional Database Manager to make managing information easy.

**IBM Operating System/2™**  
Installation Diskette

Version 1.10 © Copyright International Business Machines Corp. 1987, 1988  
Licensed Material - Program Property of IBM - All Rights Reserved  
© Copyright Microsoft Corp. 1987 - 1988  
Note to US Government Users - RESTRICTED RIGHTS LEGEND - Use, duplication, or disclosure is subject to restrictions in GSA ADP Schedule Contract with IBM Corp.

## This offer lets you do for less.

Right now, when you choose OS/2, you can get from \$100 to \$1,600 back on the kind of heavy duty memory that only OS/2 can handle. With this offer, the more memory you buy (up to 8Mb), the bigger your rebate.

Plus you can get thousands of dollars in rebates on over 100 different OS/2 programs. You can also get hundreds of dollars back on modems, accessory cards and hardware—all the things that help you do more work in less time with OS/2.

So if you're ready to move up to all the real advantages of OS/2, ask your IBM Authorized Dealer about these rebates today. To find the dealer nearest you call 1 800 IBM-2468, ext 128.

**IBM®**

## DEC software splashes aerospace market

*Offerings tout low cost and ease in designing products*

BY STANLEY GIBSON  
CW STAFF

MAYNARD, Mass. — Some new Digital Equipment Corp. software products for aerospace users will aid engineering teams in designing products faster and at less cost, according to DEC.

Electronic Data Control System (EDCS) II automates tracking, management and control of documents, allowing multiple clients to work with multiple servers, DEC said. One of the product's capabilities is an automatic notification feature that maintains lists of people affected by engineering changes and automatically informs them of a design's current status.

EDCS II was built to run on top of DEC's RDB relational database management system, which uses SQL. Other RDBMSs are not supported at this time,

according to DEC.

In beta testing now, EDCS II is scheduled to ship in September at prices ranging from \$24,000 for servers and from \$500 for clients.

DEC made a program announcement of Decview 3D, which will allow users to share two- and three-dimensional wireframe engineering drawings or integrate them into a compound document. Decview 3D is part of Decwrite and DEC's Compound Document Architecture. DEC's procedure in making program announcements generally does not include

pricing or availability dates, but availability is usually within one year after the announcement.

### Concurrent engineering

EDCS II and Decview 3D will assist engineering firms in concurrent engineering, or putting a number of engineers to work on related tasks at once, said Donald McInnis, vice-president of DEC's engineering systems group. By carrying on such parallel development, products can be created in less time and at reduced cost, he said.

Matra Datavision in Tewksbury, Mass., and Schlumberger Technologies,

Inc.'s computer-aided design and manufacturing (CAD/CAM) division said they will build direct interfaces between their CAD systems and EDCS II. Schlumberger Technologies also said it would include Decview 3D in its Bravo3 products.

In addition, DEC announced new versions of a number of computer-aided software engineering (CASE) development tools, including XD Ada for the Motorola, Inc. 68020, a VAX software environment for development of software for the Motorola microprocessor.

Other announced CASE products include the following: VAX Ada Version 2, Vaxln Ada Version 2 for real-time environments, VAX Document Version 1.2 and VAX LISP Version 3, which includes a Decwindows interface.

## CA

CONTINUED FROM PAGE 25

avoid coexistence of two database management systems. You don't want to pay double licenses," he added.

American Olean currently runs DOS/VSE SP 3.1 under VM on an IBM 3090 120E. Conforto said his firm could have moved to IBM's SQL/DS running under VM, but no migration aids were available and there appeared to be no overriding technological benefit to SQL/DS.

"In the DOS world, I can't imagine why anyone would not make a Datacom decision," Conforto said. He reported no major problems in the conversion and said ADR offered excellent support, including software engineers to help with the project.

Gordon Brown, database administrator at Affiliated Food Stores, Inc. in Keller, Texas, used CA's VSAM transparency product to move the firm's data, used in warehousing and merchandising applications, to get to Datacom DB.

### VSAM woes

Brown said his shop was experiencing a major problem with VSAM. "If we had to back out of a transaction, the files involved would not be in sync," he said.

While most users would discard the transparency software having used it once, his firm is leaving it in place as a layer of software. Affiliated does not have the programming manpower to actually convert its applications to run with Datacom DB.

Although keeping the transparency software means spending money for the license and causes somewhat slower performance than would be available without it, keeping it in place saves money compared with the time and expense it would take to convert 3,000 programs.

Nonetheless, compared with the previous VSAM performance, Brown reports performance improvements that are often 50% or better. He said his shop has done some new development that is designed to work with the transparency in place.

Brown recommended, however, that if an organization has the resources for a full conversion, they should do it.

# REALIA OFFERS A RADICAL APPROACH TO PC SOFTWARE SUPPORT: REAL ANSWERS.

When you call with questions on Realia COBOL, RealCICS, RealDL/I, or any other Realia PC programming product, you talk to an experienced programmer. Our technical support staff knows the mainframe, the PC, and the Realia products. If your question stumps them, they have direct access to the system designers. So you get the answers you need. Even more startling: If you leave a message, we call you back.

If you encounter a problem, we'll help you analyze and fix it, even if it requires an interim version of our product.

Even our upgrade policy is user-oriented. We send each upgrade automatically to all first-year users and all others who continue under maintenance for an annual fee. So you don't have to fill in forms and send money every time we announce a new release.

You don't have to send money to try a Realia product, either. Just call us for a 30-day free evaluation.

## REALIA®

10 South Riverside Plaza, Chicago, IL 60606, 312/346-0642  
34 North End Road, Hammersmith, London W14 0SH, England, 01/602-8066  
1284 Wellington Street, Ottawa ONT K1Y 3A9, Canada, 613/725-9212

## Codex forges a link to NetView

continued from page 1

tem that bidirectional control. Besides saving the cost of NetView/PC software and the IBM Personal System/2 microcomputers needed to support it, eliminating the need for NetView/PC reduces potential points of failure.

The Codex announcement is the second example in recent months of a trend toward

develop a NetView/PC face."

Codex's Thibault edged that the development of DualView took six months, but he said the strategy is in keeping with Codex's emphasis on integrated work management.

"We believe the way

## Codex Unveils Dual Model

By Matt Kramer

Codex Corp. last week introduced new firmware that permits its 2600 Series leased-line modems to be managed concurrently by IBM's NetView and Codex's management system.

With the announcement, Codex became the first major vendor to allow its

by NetView. DualView also includes options not provided by IBM's modems, Codex officials said.

"The 2600 includes a time-division multiplexer mode so you can multiplex traffic between two different computers, such as a Digital Equipment Corp. VAX or a Tandem [Computer International] system, and an IBM bi-directional system," said Bob Ries, senior vice president of Codex in

# NetView Week

The Newsweekly of

Fairchild Business Newspaper • Monday, May 15, 1989

Volume 6, Number 19

## Codex forges a direct link to NetView

By Paul Dammann  
Staff Writer

CANTON, Mass. — Codex Corp. last week announced a new product that will enable IBM NetView users to control Codex leased-line modems without using NetView/PC.

an option for Co-leased-line



## IBM MAY REPLY

## Codex IBM's

By JEANNE HIDA

CANTON, Mass. — Business Corp. has a work management breach last week communications Corp., as it introduced management system IBM's NetView control over the remote port work.

The Codex comes at a time

# Just a few of Dual

## THE BEST MODEM FOR NETVIEW ISN'T FROM IBM.

When we announced the new DualView Management Option for 2600 Series modems, it made big news.

And the biggest news is, for the first time you can choose a modem for NetView based on capability instead of compatibility.

So if you need a leased-line modem for NetView at speeds up to 19.2 kbps, now you can get it with DualView.

Along with an integral time division multiplexer, fully automatic dial back-up, and other exclusive features.

## DUALVIEW MAKES NETVIEW WORK BETTER.

DualView expands NetView's modem management capabilities with 10 unique built-in features unavailable on IBM modems.

Plus DualView totally bypasses NetView/PC, so you can monitor your modem network directly from NetView.



# Data Comm

Codemax customers can upgrade their existing modems with the option.

"I don't know why nobody thought of this before," said [redacted] man, an analyst with [redacted] firm The Yan-

IBM's modem commands, so modems can stand and interpret IBM work PDA commands. NetView only reacts to communications have while the Codex management system lets network managers react before a problem when network conditions begin to degrade.

NEWS

**CANTON, Mass.** — Codex Corp. introduced last week what may be the first direct link between a non-IBM leased-line modem and IBM's Netview.

Coder's Dualview Management Option uses IBM's own Link Problem Determination Aid 2 (LPDA2) protocols to allow Netview operators to monitor, reconfigure and collect alerts and alarms from the Coder 2600 series of high-speed processors.

However, the Codex product bypasses Netview/PC. IBM's recommended Netview route for third parties, thereby tackling the computer giant on its home ground in the heated high end of

the modem market, one said.

By providing its own modems with the same Netview capabilities that IBM modems enjoy, Coda hopes to eliminate IBM's ability to "gain account control via Netview," said Codex senior product planner Robert Ries.

Customers for whom Netview-based control is a prerequisite can now shop beyond IBM.

said that the next step in integrating network management functions is IBM's. Right now, Ries says, customers don't have to be Codex network management system to use this option. When we have more comprehensive integration (with a new environment), customers will need to have the Command," Ries said. Now, all NetView commands can be executed through a terminal that can be accessed by a user who is only using Net-

ew) opens new chan-  
and strengthens our  
largest industry ven-  
lems)," Rice added

NetView customers can use Dualview to manage modems through NetView or they can manage modems through both NetView and Codex Network Management Systems.

MIS can manage applications layer traffic through NetView at the same time as communications managers manage through the Codex system.

This is a genuine step toward genuine multi-vendor

NetView's  
and Control Facility  
offer more features  
does. For example,  
for only one fallback  
speed, while DualView  
multiple fallbacks.  
added functions  
provides are dis-  
based alarms and  
store complex  
network config-

DualView does more than let your modems talk directly with NetView. It lets you talk simultaneously to a Codex Integrated Network Management System that does a lot of things NetView can't, like predict problems and help solve them, instead of just reacting to them.

What this all adds up to is the best of everything for

you: NetView to manage your SNA environment, and Codex to manage your data communications network.

**CALL US FOR A DUALVIEW PREVIEW.**

We invite you to give DualView your own review. To learn how it makes NetView more productive, call us toll free at 1-800-426-1212 Ext. 7235.

And find out what everybody's been raving about.

codex

 **MOTOROLA**

# VAX<sup>SM</sup> FAX

digital<sup>TM</sup>

DIGITAL'S INSTANT INFORMATION SERVICE

Get facts fast on why  
over 8,000,000 people,  
running tens of  
thousands of  
applications, all use the  
same computer. VAX<sup>TM</sup>  
To get quick answers  
by FAX, just call

1-800-842-5273.

Digital  
has  
it  
now.

## Szuprowicz

FROM PAGE 23

Expert system Help desks in computer organizations are often a cop-out for the IS group, because such Help desks are perceived by IS as the simplest way to get into expert systems with the minimum of risk. What's more, an expert system Help desk is easy to implement because the knowledge base pertains to activities that are familiar to the developers.

IS staffers are computer people, entrenched in their own worlds, often with little time or interest in the business of their employers. Development of strategic expert systems requires close interaction with business managers, who are the experts, and end users. IS involvement in such systems means giving up control. As a result, many IS departments pay lip service to expert system technology by choosing to develop the automated Help desk, perhaps even secretly hoping that when little visible return on investment is observed, the expert system promoters will go away.

Now we turn to all the other Help desks, which may be customer service operations that corporations are forced to maintain to quickly solve customer problems. As the world rushes into the knowledge-based, competitive battlefield of tomorrow, corporations are realizing that survival depends more than ever on quality of service.

Already there are human Help desks in many areas, but these are often prone to errors and seldom available when they are most needed. In fact, during peak demand periods, customers are wasting valuable minutes, if not hours, just waiting for an agent to respond. There is a massive telecommunications traffic jam in the making, fueled by the availability of free telephone access numbers and television-supported publicity.

Here, then, is an opportunity for IS to step in and develop strategic expert system Help desks for their companies. One equipment rental organization that took the trouble to analyze its telemarketing Help desk activity found out, to its surprise, that prospects and clients would not tolerate more than two minutes of waiting, while their staffs needed up to 30 minutes to answer complex requests.

This type of situation spells opportunities for IS organizations. They should take the initiative to identify such strategic applications and develop the information infrastructures for the marketing of tomorrow.

Szuprowicz is a senior consultant at the Touche-Ross Knowledge-Based Systems Center.

## Covia's Travelmaster hooks up with CRS

ROSEMONT, Ill. — Covia Corp.'s Travelmaster travel-expense management software, introduced earlier this year, has been bridged to the company's Apollo computer reservation system (CRS).

The interface will allow travel agencies — approximately

10,000 agencies worldwide use the Apollo CRS — to transmit transaction records to the corporate client's Travelmaster host, Covia said.

The advantage of having air, car and hotel travel reservation expenses integrated with other corporate expenses is that it im-

proves a company's ability to track its expenses and negotiate these bills prior to the business trip, according to Covia.

At the ticketing site, a non-dedicated IBM Personal Computer or compatible is connected to Apollo over a standard RS-232 connection. Transaction

records are collected in Apollo and then dumped into the PC, which converts them into 80K-byte records. Records can be either delivered as floppy disks or transmitted by a modem or over a local-area network to the Travelmaster host.

In addition to the Travelmaster-Apollo interface, Covia announced a LAN implementation of Travelmaster.

Systems software for MVS data centers:

## Enter the world of total security, total support.

Computer Associates presents the industry's only complete security software solution:

**CA-UNIPACK™ SCA**  
**SECURITY, CONTROL AND AUDITING**  
Consisting of CA-ACF2™ or CA-TOP SECRET™, CA-VMAN™ and CA-EXAMINE™.

Utilizing advanced security techniques and integrated industry-leading software, CA-UNIPACK/SCA provides total access control, enhanced network security and complete MVS operating system auditing capabilities including virus detection.

With the industry's largest and most knowl-

edgeable security staff, Computer Associates alone has the resources and expertise to provide this cost-effective solution. And no one else can match CA's commitment to the present and future of the security industry.

And only Computer Associates offers **CA-UNISERVICE™ II**, a secure link between your mainframe and CA's Customer Service System 24 hours a day. You get online access to software fixes, interactive problem resolution, plus product tutorials and more!

Call Dana Williams today:  
**800-645-3003**

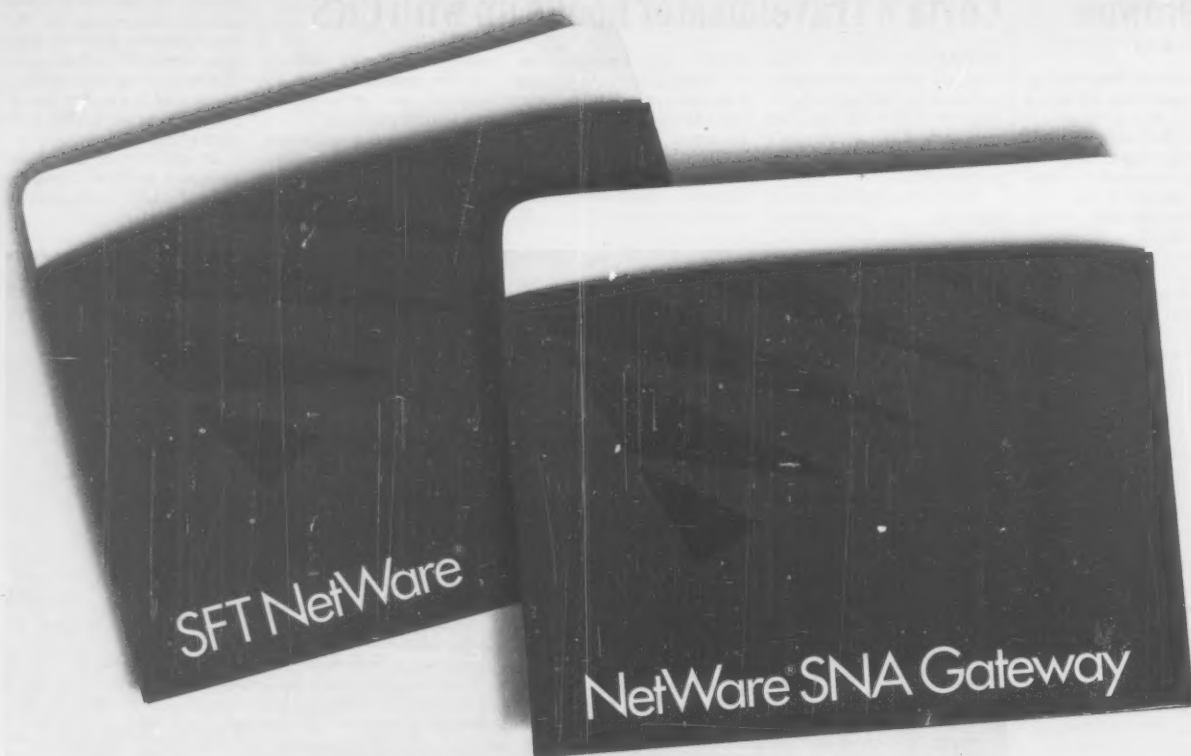
**COMPUTER ASSOCIATES**  
Software superior by design.

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

- World's leading independent software company.
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers.
- Worldwide service and support network of more than 100 offices.

© 1989 Computer Associates International, Inc.  
711 Second Ave., Garden City, NY 11530-0171





## Free refills through August 31st.

**Version level upgrade with purchase.** Buy Novell SFT NetWare® or a NetWare® SNA Gateway™ through August 31st, and get a certificate for a free version level upgrade. Then, one time during the next 12 months, you can update your Novell network operating system or gateway to the latest version. Absolutely free.

**SFT NetWare.** SFT NetWare is the only LAN operating system software that offers the sophisticated features and functionality available on mainframes and minicomputers. Features like multi-level security, resource accounting, and the industry's most advanced system reliability. Advanced features that make it today's workgroup computing standard.

**NetWare SNA Gateway.** NetWare SNA Gateways have set a new standard for reliability in LAN-to-mainframe connectivity. A standard which extends your

information resources beyond the workgroup. Your network users can now access powerful mainframe databases and applications, and share important company information at the desktop. And do so with unsurpassed reliability and control.

**See your Novell Authorized Reseller.** To get today's most advanced networking products, see your Novell Authorized Reseller, or call 1-800-LANKIND. But hurry, this free refill offer ends August 31st.



**For network solutions,  
you should be seeing red.**

\*Upgrade is limited to new feature upgrades such as SFT NetWare v2.12 to v2.15, and does not include product architecture upgrades such as SFT NetWare v2.X to v3.X. Novell product manuals will be offered at a discount as part of this promotion.

## NEW PRODUCTS — SYSTEMS

## Processors

Dynamics Research Corp. has announced a natural language processing workstation for retrieving ad hoc information from Oracle Corp.'s Oracle databases running on Digital Equipment Corp. VAX computers.

The Spock Information Station lets work group users enter queries for Oracle databases in natural English, the vendor said. The data is then retrieved for display, printing or filing.

The system is designed to be centrally located in a work group and consists of Spock software and an Intel Corp. 80386-based IBM-compatible personal computer with 4M bytes of random-access memory.

An Intel Corp. 80387 coprocessor, a 1.2M-byte floppy disk, a 40M-byte hard drive and a color monitor are also included. The system is priced at \$8,949.

**Dynamics Research**  
60 Frontage Road  
Andover, Mass. 01810  
508-475-9090

## Data storage

Distributed Logic Corp. has introduced the Power Disk Series Winchester storage subsystems.

Developed for Digital Equipment Corp. system users, the 5¼-in. form factor enhanced small device interface (ESDI) drives reportedly provide up to 673M bytes of formatted capacity per drive.

Features include a 2.4M byte/sec. data transfer rate and a 16 msec average seek time, according to the vendor. All models are shipped with a disk controller and cable set, and pricing begins at \$7,400.

**Distributed Logic**  
1555 S. Sinclair St.  
Anaheim, Calif. 92806  
714-937-5700

An 8-in. parallel-transfer disk subsystem which reportedly connects Fujitsu America, Inc.'s M2380A Parallel Transfer Disk to a variety of host computers, including those from Digital Equipment Corp. and IBM's Personal Computer AT, has been introduced by Storage Concepts, Inc.

The Concept 380 is reportedly capable of connecting as many as four M2380A devices, each with a transfer rate of 12M byte/sec. and a storage capacity of 889M bytes. Device drivers that are currently available include Sun Microsystems, Inc.'s SunOS Versions 3 and 4, Digital Equipment Corp.'s VMS and IBM's PC-DOS, the company said. The product is priced at \$26,900.

**Storage Concepts**  
1622 Deere Ave.  
Irvine, Calif. 92714  
714-557-5064

U.S. Design Corp. has expanded its VIP family of storage subsystems with the addition of the VIP/H, designed for use with Digital Equipment Corp. systems.

The product reportedly incorporates a protocol converter to allow connections to DEC sys-

tems via the small device interface. The unit provides 760M bytes to 3G bytes of storage and is packaged in a 5¼- by 19-in. rack-mount enclosure, according to the vendor. Pricing ranges from \$18,900 to \$35,100, depending on configuration.

**U.S. Design**  
4311 Forbes Blvd.  
Lanham, Md. 20706  
301-577-2880

Real Time Enterprises, Inc. has announced a 5¼-in. optical disk jukebox subsystem developed for machines from Hewlett-Packard Co.'s Apollo division.

Called the ODFM-5252JL, the product reportedly offers support for all Apollo nodes including the Series 3000, Series 3500, Series 4500 and the Series 10000. The subsystem uses 25 platters and offers a storage

capacity of 16G bytes, and as many as three jukeboxes may be used on one server, the vendor said. Scheduled for delivery in August, the jukebox will carry a price tag of approximately \$45,000.

**Real Time Enterprises**  
16 Tobey Village Office  
Park  
Pittsford, N.Y. 14534  
716-383-1290

Systems software for MVS data centers:

## Enter the world of total administration, total support.

Presenting **CA-UNIPACK™ DCA**, an advanced software system from Computer Associates that automates the complex tasks of MVS data center management.

### CA-UNIPACK/DCA—DATA CENTER ADMINISTRATION

Consisting of: CA-NETMAN™/FINANCIAL INVENTORY, CA-NETMAN™/PROBLEM CHANGE, CA-NETMAN™/OLCF and CA-NETMAN™/MRM.

CA-UNIPACK/DCA automates and integrates hardware and software inventory management, help desk and problem tracking, configuration changes, invoice reconciliations, cost allocations, budgets, vendor contracts, user chargebacks, order tracking and more. It has the unique ability to interrelate these diverse activities so that a change in one area is immediately and automatically reflected in another. Additionally,

CA-UNIPACK/DCA provides specialized functionality in managing and analyzing activities related to PCs and workstations.

CA-UNIPACK/DCA provides online, real-time control over critical managerial functions while it reduces costs, increases staff productivity and ensures sound decision making. Total administrative control. Only from Computer Associates.

And only Computer Associates offers **CA-UNISERVICE™ II**, a secure link between your mainframe and CA's Customer Service System 24 hours a day. You get online access to software fixes, interactive problem resolution, plus product tutorials and more!

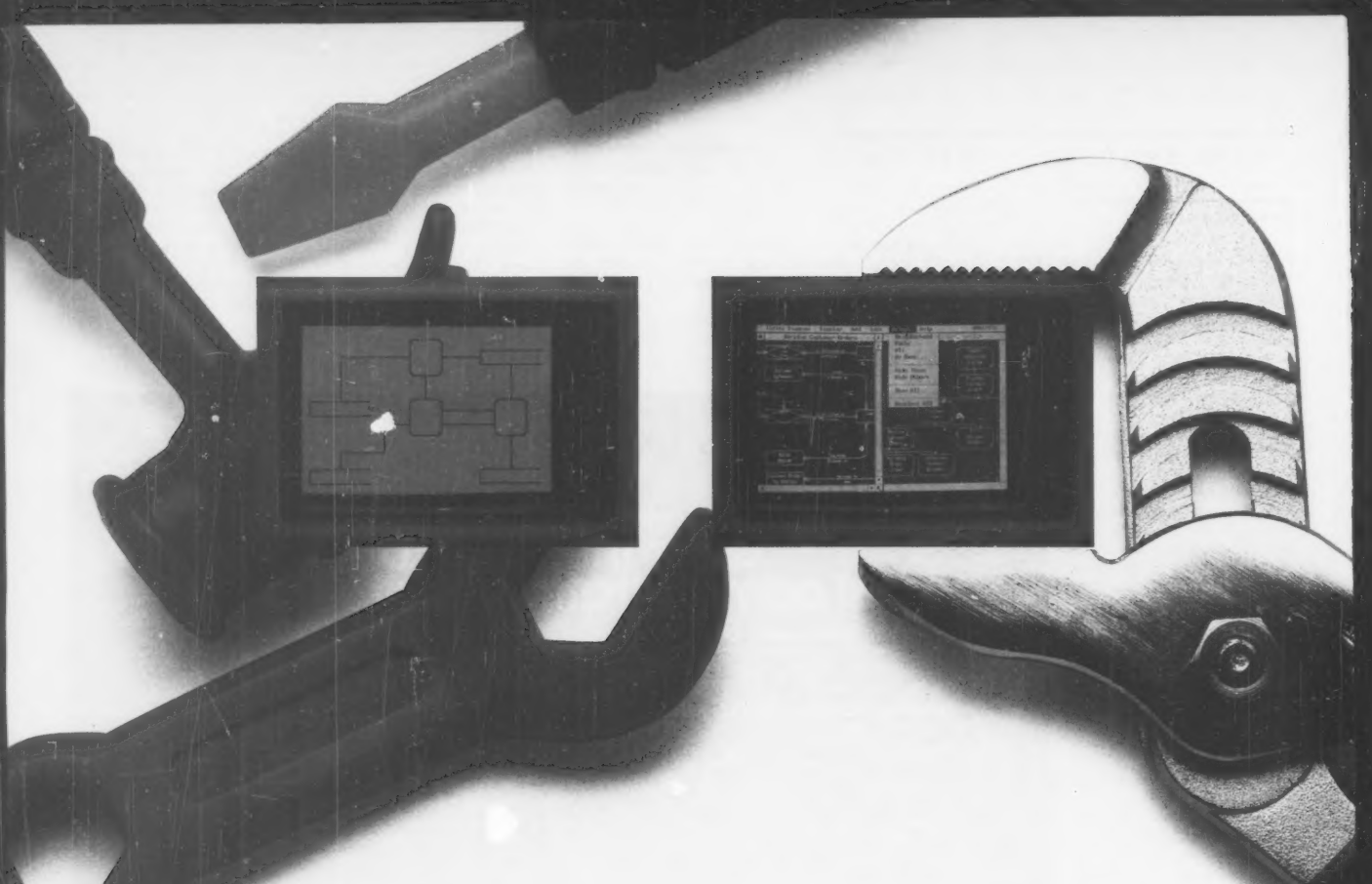
Call Dana Williams today  
800-645-3003

**COMPUTER ASSOCIATES**  
Software superior by design

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

- World's leading independent software company
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers
- Worldwide service and support network of more than 100 offices

© 1989 Computer Associates International, Inc.  
711 Stewart Ave., Garden City, NY 11530-1011



## For CASE tools you won't outgrow, choose KnowledgeWare: Real tools for real work.

Most CASE tools look impressive when you first try them out. But many are disappointing when you get down to real work. You may be able to draw a lot of diagrams. But in one way or another, the tools prove deficient when you start building and modifying full-scale systems.

You can do better. Simply choose the tool set designed with real work in mind: the Information Engineering Workbench® from KnowledgeWare.

### Real tools that can generate complete, working applications

Our PC-based tools for planning, analysis, and design let you capture all of your application requirements and specifications as diagrams. If you wish, you can then use those diagrams to *automatically* generate 100% of the COBOL source code with our mainframe applications generator, IEW/GAMMA™.

### Real tools to support DB2 and other file access methods

Diagram a relational database and our tools can generate SQL DDL and DML statements *automatically*. This means that people using KnowledgeWare tools don't have to be experts in DB2. Plus, they can develop complex systems with more than one DBMS strategy. Like systems that use both VSAM and DB2, in either on-line

or batch modes. And once you have a logical data model, our tools will *automatically* transform it into a physical database.

### Real tools with re-engineering capabilities you can use today

Our load utility lets you capture and reuse or modify existing IMS database definitions and COBOL data structures. Our tools can generate diagrams based on your existing IMS data definitions *automatically*. You can also load COBOL record descriptions and *automatically* create the associated data structure diagrams.

### Real tools with a common Encyclopedia to ensure consistency

Since all of our tools share a common Encyclopedia, information is consistent throughout the entire development process: Any changes made with one tool are *automatically* reflected in the diagrams and definitions of the other tools. As a result, developers can focus on design instead of focusing on hunting down inconsistencies.

### Real tools with the flexibility to fit your way of working

With KnowledgeWare tools, you're free to build applications almost any way you like. Ideally,

you might start with the planning tool, move to the analysis and design tools, and then produce a working application with IEW/GAMMA.

But if that's not the way you work, you can start application development with any KnowledgeWare tool. For example, you can do some design and then go back and work on analysis. Plus, you can choose from a number of the most commonly used methodologies and techniques. In short, you can put our tools to work without giving up methods that already work for you.

Call 1-800-338-4130

For more information on our Planning, Analysis, and Design Workstations, or any of our mainframe CASE tools, call our toll-free number (in Georgia, call 404/231-8575). KnowledgeWare, Inc., 3340 Peachtree Rd. N.E., Suite 1100, Atlanta, Georgia 30026.



**KnowledgeWare®**

*The World's Most  
Comprehensive CASE Tool Set™*



## NEW PRODUCTS — SOFTWARE

## Development tools

National Advanced Systems has announced Vast-2 Release 1.0 and NAS Lib Release 2.0 for IBM MVS and VM environments.

Vast-2 is reported to be an intelligent programming tool designed to assist users in optimally vectorizing Fortran source code on the NAS AS/EX series vector processing systems. The Vast-2 precompiler converts DO loops that pass evaluation into Calls to the NAS Lib Math Vector Library of standard mathematical subroutines, the vendor said. Vast-2 Release 1.0 costs \$20,000.

NAS Lib Release 2.0 is an enhanced version of the mathematical subroutine library, which provides optimized vector and matrix operations. The product is priced at \$10,000.

NAS  
P.O. Box 54996  
Santa Clara, Calif. 95054  
408-970-4356

## Software applications packages

J. L. Computer Systems, Inc. has announced Version 5.0 of its business software packages for DOS and Digital Equipment Corp. VAX/VMS systems.

Version 5.0 reportedly will provide window processing with pull-down menus, selected menus and pop-up displays. Integrated packages available with the base module include the following: accounts payable and receivable, general ledger, payroll, inventory management, job costing and analysis, invoicing and human resource management. Pricing ranges from \$600 to \$7,200 per package, depending on the CPU platform.

J. L. Computer Systems  
3403 Lancaster Ave.  
Wilmington, Del. 19805  
302-998-8030

Peoplesoft, Inc. has introduced an SQL-based application system for human resource management.

Key components of the Human Resource Management System (HRMS) address payroll, flexible benefits, personnel administration, training and development, benefits administration and recruiting. The system is said to operate on a single workstation, in a local-area network or in a mainframe environment using DB2.

The cost of HRMS for a single workstation is \$55,000. For use in a LAN environment, the price is \$210,000.

Peoplesoft  
1600 S. Main St.  
Walnut Creek, Calif. 94596  
415-946-9460

## Utilities

Amalgamated Software of North America, Inc. (ASNA) has announced Release 6.0 of RPG/III, with features designed to provide increased throughput call procedures and improve migration

to the IBM Application System/400 computer.

The software reportedly allows both users and systems procedures to be called, and parameters can be passed to a procedure the same way they are passed to a program, the company said.

RPG-III Version 6.0 is available on a 30-day, free-trial basis, the company said.

ASNA  
4041 MacArthur Blvd.  
Newport Beach, Calif.  
92660  
714-752-7991

Davis, Thomas and Associates, Inc. has announced a software utility designed to transfer, archive, resegment and resequence reports from any combination of VM/SP spool queues.

Called DTA/Copy, the stand-alone product reportedly supports IBM mainframe hardware running VSE/SP and VM operating systems. A permanent license is available for \$3,000.

Davis, Thomas and Associates  
550 Waterford Park  
505 N. County Road  
Minneapolis, Minn. 55441  
612-591-6100

Systems software for MVS data centers:

## Enter the world of total production control, total support.

Computer Associates presents **CA-UNIPACK™ APC**, the only production control software system to offer real solutions that meet the growing demand for unattended operations.

### CA-UNIPACK APC—AUTOMATED PRODUCTION CONTROL

Consisting of: CA-SCHEDULE™ or CA-7™, CA-11™, CA-OPERA™, CA-ARCDOC™, CA-JCLCHECK™, CA-DISPATCH™ and CA-WAPS™.

Unattended operations is now a reality because CA-UNIPACK/APC provides automation for the entire production operation. Automating workload planning and scheduling, production JCL set up and validation, realtime monitoring and problem identification, restart and recovery, console activity management and report distribution.

As an advanced, integrated production control system, CA-UNIPACK/APC creates a synergy that results in startling productivity gains including improved workload throughput, system availability and end-user service levels.

Only Computer Associates has the products and expertise to provide MVS data centers with such a cost-effective, total solution.

And only Computer Associates offers **CA-UNISERVICE™ II**, a secure link between your mainframe and CA's Customer Service System, 24 hours a day. You get online access to software fixes, interactive problem resolution, plus product tutorials and more!

Call Dana Williams today: 800-645-3003



© 1989 Computer Associates International, Inc.  
711 Stewart Avenue, Garden City, NY 11530-4787

**COMPUTER ASSOCIATES**  
Software superior by design

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

- World's leading independent software company
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers
- Worldwide service and support network of more than 100 offices



# INSTANT MAINFRAME. JUST ADD SCO.

Not too long ago, a few dozen people sharing the same programs, resources, and information on a single computer at the same time meant only one thing—a mainframe.

Powerful, big, expensive, and proprietary.

More recently, the same people could be found doing exactly the same things—simultaneously sharing programs, resources, and information—on a minicomputer.

A lot cheaper, a lot smaller, yet powerful enough to do the same jobs. And just as proprietary.

Then along came the latest generation of personal computers. And now, the same people are more and more likely to be found doing exactly the same things—simultaneously sharing programs, resources, and information—on a PC.

And not a whole officeful of PCs networked together, either, but *a single PC powering the whole office at once.*

A lot cheaper, a lot smaller, yet still easily powerful enough to do the same jobs. Built to non-proprietary, open system standards that allow complete freedom of choice in hardware and software.

And running the industry-choice multiuser, multitasking UNIX® System V platform that gives millions of 286- and 386-based PC users mainframe power every business day.

The UNIX System standard for PCs—SCO.™

Today, SCO UNIX System solutions are installed on more than one in ten of all leading 386 computers in operation worldwide.

Running thousands of off-the-shelf XENIX® and UNIX System-based applications on powerful standard business systems supporting 32 or even more workstations—at an unbelievably low cost per user. And with such blazing performance that individual users believe they have the whole system to themselves.

Running electronic mail across the office—or around the world—in seconds.

Running multiuser PC communications to minis and mainframes through TCP/IP and SNA networks.

And doing some things that no mainframe—or even DOS- or AOS/2™-based PC—ever thought about, such as running multiple DOS applications. Or networking DOS, OS/2, XENIX and UNIX Systems together. Or running UNIX System versions and workalikes of popular DOS applications such as Microsoft® Word, 1-2-3®, and dBASE III PLUS.®

Or even letting users integrate full-featured multiuser productivity packages *of their choice* under a standard, friendly menu interface.

Today's personal computer isn't just a "PC" anymore, and you can unleash its incredible mainframe-plus power for yourself—today.

Just add SCO.

*The SCO family of UNIX System software solutions is available for all 80286- and 80386-based industry-standard and Micro Channel™ computers.*

UNIX is a registered trademark of AT&T. SCO and the SCO logo are trademarks of The Santa Cruz Operation, Inc. Microsoft and XENIX are registered trademarks of Microsoft Corporation. OS/2 and Micro Channel are trademarks of International Business Machines Corporation. 1-2-3 is a registered trademark of Lotus Development Corporation. dBASE III PLUS is a registered trademark of Ashton-Tate.  
©1989 The Santa Cruz Operation, Inc., 480 Encinal Street, P.O. Box 1900, Santa Cruz, California 95061 USA  
The Santa Cruz Operation, Ltd., Crossley Centre, Hatters Lane, Wotton 1ST 3TN, United Kingdom, +44 (0)923 816344, FAX: +44 (0)923 817781, TELEX: 917372 sco

**SCO**  
THE SANTA CRUZ OPERATION

(800) 626-UNIX (626-8649)

(408) 425-7222

FAX: (408) 458-4227

E-MAIL: ...!uunet!sco!info info@sco.COM

# PCs & WORKSTATIONS

## MICROBITS

Douglas Barney

### Battling a phantom



**1-2-3, it's out!** It may sound strange, but Terry Bourne says he is happy Lotus' 1-2-3 Release 3.0 is finally out. Bourne makes his money selling Microsoft Excel — often to hesitant and sometimes hostile end users and information systems professionals.

A new spreadsheet from Lotus could be a nightmare. Yet Bourne is unperturbed. Maybe it's because he's spent time in the trenches getting thoroughly covered with the muck of software war. When he was a Midwest sales guy for Excel, Bourne bumped his head against the 1-2-3 wall so many times that he no longer felt any pain. Armed with a calloused forehead, he simply kept banging, and increasingly his head made it through as select customers converted to Excel.

If you're an IS manager from America's heartland, you've probably met the guy. You might have bought his pitch or thrown him out of your office. In 18 months, Bourne did some 270 presentations. It must have gotten easy after the first couple hundred.

*Continued on page 44*

## Getting a PC foot in the door

*Users do not need to be systems gurus for firms' investments to pay off*

BY MICHAEL ALEXANDER  
CW STAFF

While end users seldom take full advantage of the applications they purchase, it may not mean they are not getting their money's worth, according to several managers interviewed recently who are responsible for end-user training and support. The benefits of using personal computers outweigh the initial investment in most cases, they concluded.

"End users will try to learn everything about a product and use it to the fullest, but I am not 100% sure that they need to

cost-justify it to that extent," said Randall Mikan, manager of systems and programming at Employers Insurance Co. in Dallas. It is more important that the application meets the needs intended when it was acquired, he added.

"In most cases they use the applications to the minimum rather than the maximum," said Jeffrey Goldwasser, director of MIS for the city of Bridgeport, Conn. Nevertheless, his department is pushing end users to expand their acquisition and use of personal computers, Wasserman said.

His department's first priority is to get end users to adopt the technology and then build on it by training them to use specific applications wherever they will have a beneficial impact, he said.

"As long as they are living within budget, then anything is an improvement, and it is certainly better than pencil and paper," Wasserman said. "We want them to expand the purchase of micros to get the smaller applications off the mainframe. We don't have the resources to support PC-type operations, so from my end it is to my advantage." In comparison,

PC applications are inexpensive, Wasserman said.

Several studies by management consultants and market researchers indicate that end users underuse or even give up on applications that they have acquired. A study by National Training and Computers Project in Raquette Lake, N.Y., for example, noted that end users do not maximize their investments in applications software, most often because they are inadequately trained or simply do not spend sufficient time learning the program. Too often, end users and their managers have unrealistic expectations of how quickly they can learn to use specific applications.

"Sometimes end users are immersed in getting the applica-

*Continued on page 44*

## Library of Congress: Thanks for the Memory

### ON SITE

BY PATRICK WAURZYNIAK  
CW STAFF

WASHINGTON, D.C. — Apple Computer Inc.'s Macintosh microcomputers, compact disks and laser videodisks are being integrated as part of the Library of Congress' plan to offer automated public access to thousands of its rare historical manuscripts, photographs and political cartoon prints.

The library has built a prototype system for a project called American Memory, which uses the laser disk technology cou-

pled with Macintosh SE computers to disseminate electronic versions of portions of its historical collections to libraries throughout the country.

Although much of the project is in its early planning stages, the Library of Congress would eventually like to make its collections available to researchers online, said project coordinator Carl Fleischhauer.

"That's a glimmer in our eye," Fleischhauer said. "The project as a whole is very ambitious. It is so ambitious that it could be five to 10 years before a

large critical mass of information is available. But we have to start somewhere."

The Library of Congress, which has sold and distributed its printed catalog cards to U.S. libraries since 1901, initially will make its historical collections available on laser videodisks and compact disks.

Portions of those collections will be grouped in a thematic series, the first part of which has been inspired by the library's program to celebrate the 200th anniversary of the U.S. Congress.



The first collection, planned for availability in 1990, includes images of a group of 300 18th-century broadsides associated with the Continental Congress and 1,500 19th-century daguerreotypes, many of which are portraits of

early legislators.

A second series, titled "Visions of America: Seeing the Nation through the Lens of Popular Art and Culture," will include 20 hours of ethnic folk music recorded in Northern California during the 1930s as well as 3,000 Currier and Ives prints.

The project, initiated by James H. Billington when he was sworn in as Librarian of Congress in 1987, has been in the planning stages for almost a

*Continued on page 45*

### Inside

- Product reviews of Ultra-lite, Lucid 3-D and Viewlink. Page 41.
- Start-up announces LAN file search system. Page 45.
- Police chief tracks area with DBMS. Page 46.

## If You Like the new IBM Mainframe COBOL Release, Check Out These Features in Micro Focus COBOL/2!

IBM® is now shipping VS COBOL II Release 3 to its customers. Many new features are supported in Release 3, including High Level ANSI '85 and FIPS syntax.

There is only one PC COBOL that puts all of these IBM VS COBOL II Release 3 features on your desktop.

### Micro Focus COBOL/2™

Micro Focus COBOL/2 includes the compiler and ANIMATOR™, the most powerful COBOL source code debugger available on the mainframe or PC. Running under DOS or OS/2, COBOL/2 provides mainframe compatibility and PC productivity. And of course OS/VS COBOL and VS COBOL II Release 2 syntaxes are still supported.

- High Level ANSI '85 and FIPS
- Full SAA COBOL Conformance
- Hexadecimal Literals
- Seven Level Tables
- Both '85 and '74 Standard File Status Codes
- Both '85 or '74 Report-Writer Syntax
- Source Code With Mixed Upper and Lower Case Letters
- Nested Programs
- EXTERNAL and GLOBAL Data
- CALL ... USING BY CONTENT for a Data-name or Literal
- Mixed Subscripts and Indexes
- INITIALIZE and EVALUATE
- NOT AT END, NOT ON SIZE, and NOT INVALID KEY
- Access to a Variable Length File's Length Information
- Reference Modification to Obtain a Substring of a Data-item
- INSPECT CONVERTING as an ANSI Replacement for TRANSFORM
- VALUE Clauses for Data-items in a Table
- >= and <= Relational Operators
- De-Editing of Numeric Edited Data-items
- Relative Subscripting

The COBOL/2 development environment can be the cornerstone of your successful mainframe development strategy. Ask about Micro Focus COBOL/2 Workbench™ with CICS, CICS DL/I, IMS DB/DC, DB2 or IDMS development tools.

If you're not getting the power of VS COBOL II Release 3 on your PC, call us now!

1-800-872-6265

**MICRO FOCUS®**

*A Better Way of Programming™*

**Micro Focus Puts The Mainframe On Your Desktop!**



# Before You Start Your File On Our LAN Communications Products, Consider The Driving Force Behind Them.



Once upon a time, there was a car that made the complex job of transporting people look remarkably simple. When we got into LAN Communications at DCA<sup>®</sup>, we started simply too. But as the job of transporting information became more complex, we made some very sophisticated additions to our product line. Today we have a wide range of LAN Communications products, like our IRMALAN<sup>™</sup>, DCA Select, and 10NET<sup>™</sup> local area networks, but we never forget the driving philosophy behind them. Like the Beetle<sup>®</sup>, they get you where you want to go. And that's reason enough to start a file on DCA today. **DCA**

A White Paper by DCA

## The Merging of PC LANs and 3270 Networks

A Prospect

PC WEEK

CONNECTIVITY

MICRO-MINI-MA

MANAGEMENT INFORMATION SYSTEMS WEEK

### LAN Acquisitions Shift To Corporate MIS Level

By GEORGE BRIGGS

BOSTON—Two new trends emerging in the personal-computer local area network marketplace—a shift in who is buying the equipment and a subsequent refocusing of vendor selling strategy—together will change the nature of the LAN market permanently.

the host  
the U.  
"The  
likely  
away  
ing sy  
putting  
desktop  
My  
ed of  
chose  
had  
The  
all  
ma  
will  
sim  
per

### IRMALAN Products Establish DCA as Leader in LAN Mainframe Gateways

By David Strom

Digital Communications Associates' (DCA's) new IrmaLAN 3725 Gateway, IrmaLAN SNA Workstation version 2 and APA Workstation version 2 products are a big step for the Alpharetta, Ga., communications firm. With these new products, DCA has the strongest local area network (LAN) mainframe-gateway product line of any vendor, including IBM.

The new IRMA...

PC MAGAZINE • OCTOBER 11, 1988

MANAGEMENT INFORMATION SYSTEMS WEEK

### DCA Fulfills 10NET's Charter With Several LAN Products

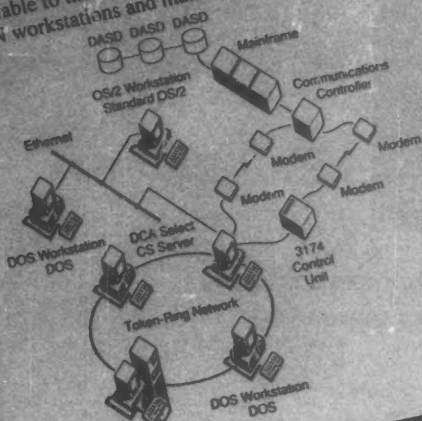
By TEN ROBINSON

NEW YORK—10NET Communications, after be-

### 10NET Plus: Everything PC LAN Do Plus E-mail and Group Sch

PC HANDS ON

The following graphic depicts the many options available to the user with DCA Select CS for LAN workstations and mainframe connectivity.



Please send me additional information on  
DCA's LAN Communications Products:

- ☐ DCA IRMALAN Gateways
- ☐ DCA IRMALAN Workstation Products
- ☐ DCA 10NET Local Area Networks
- ☐ DCA 10NET LAN Products
- ☐ DCA OS/2 Select Products

Customer Representative  
Marketing Information Group

DCA

1000 Alderman Drive  
Alpharetta, GA 30201-4199  
1-800-241-4762, Ext. 51  
In Georgia 404-442-4500, Ext. 51

Photograph © 1989 by Andrew Fenniger



Change is the enemy of procedural programming. Altering one aspect of a program can take weeks. And while you redesign, recode and retest, you spend huge sums of money, and sacrifice irretrievable market opportunities.

Unfortunately, change is inevitable, and survival depends on your ability to adapt. That's not just a cruel law of nature. It's a hard fact of business.

It's time that programming, too, embraced change.

The time has come for Objectworks, the object-oriented development system from ParcPlace.

Objectworks for Smalltalk-80 and Objectworks for C++ provide the tools to create and deliver programs designed to work in the fast-moving, ever-changing world of business.

More and more companies are evolving to Objectworks for designing commercial applications. Because designing for the future means designing for change.

## Objectworks



ParcPlace Systems

1550 Plymouth Street

Mountain View, CA 94043

800-822-7860. In CA (415) 691-6700

By its very nature, the world embraces change.  
By its very nature, conventional programming does not.

ParcPlace products are available on 80386 MS-DOS, Sun, Macintosh, DECstation 3100, and HP-9000 Series 300. Smalltalk-80 and Objectworks are trademarks of ParcPlace Systems, Inc. All other brands are trademarks of their respective holders. ©1989 ParcPlace Systems, Inc.



## PRODUCT REVIEWS

### Viewlink reality fails to meet expectations

Imagine how useful it would be if, within a report, you could position your cursor on a key word and automatically link it to a spreadsheet related to that word.

Viewlink 1.0, from Traveling Software, Inc., is a utility program that lets you organize your projects and customize file management by linking related items together into views, regardless of the application with which the

top of Viewlink, and once you get your system set up, you can access another application program from within Viewlink. Within an application, you can access Viewlink's macro capability and a copy/paste feature that works across different applications. A program bug prevents pasting of text into item notes.

Viewlink has two features that are intended to automate some aspects of linking. Auto



Traveling Software's Viewlink features automatic linking

items work. For example, a business project might use a report in Microsoft Corp. Word, several Lotus Development Corp. 1-2-3 spreadsheets and Lotus Freelance graphics files.

Viewlink divides the screen into two vertical windows: views on the left and items on the right. As you scroll through the views,

Link will link a file to a view based on text contained in the file. Automatic View Update lets you designate inclusion criteria for a view.

#### First things first

Unfortunately, files must first be designated as items before any of these "automatic" features will work. Designating files as items is basically a manual process and can be done on a file-by-file basis or more globally via a menu option — a very slow process if new files are scattered across several directories. If a file has not been designated as an item, it is likely to be overlooked during linking.

Theoretically, you can create a view of all files on your hard disk. However, having a view with even several hundred files slows the entire program down considerably. This severely limits the usefulness of this program as a file manager.

Viewlink's macros attempt to impose common commands for your applications. In addition, macros can be used to load an application without a file, load an application with a selected file, print a file and load an application and create a file that does not yet exist.

Documentation consists of a

*Continued on page 42*

### Ultralite: Weight's great, less power

The NEC Corp. Ultralite is a lightweight IBM Personal Computer-compatible laptop that is small enough to fit into almost any briefcase.

The entire machine weighs only 4.4 pounds and measures 11.9 in. wide, 8.3 in. deep and 1.4 in. thick.

Performance is at the top end of the range for PC XT-compatible machines, though relatively slow compared with PC AT-compatibles and 386-based machines.

Reflecting one of the trade-offs NEC made to earn the name Ultralite, the battery lasted only one hour and 45 minutes, even starting with a full charge and ignoring the low-battery warning.

#### One catch

One of the most serious drawbacks of the Ultralite is the volatility of the solid-state disk. If you do not recharge the machine every five to seven days, the random-access memory disk contents will be lost.

It combines an NEC V30 processor with a 9.83-MHz clock

speed and a 1M- or 2M-byte solid-state RAM disk.

The standard configuration includes 640K bytes of RAM and the full Microsoft Corp. MS-DOS operating system stored in built-in read-only memory (ROM).

The ROM, addressed as drive D, also includes Microsoft's DOS Manager, setup programs specific to the Ultralite and a special version of Traveling Software, Inc.'s Laplink file exchange software.

The 8.3- by 4.2-in. backlit LCD is similar to the one on the larger NEC Multispeed Series laptop computers.

Connectors are provided for a serial cable, an optional external 3-in. floppy drive or parallel port adapter and phone connections for the built-in 2,400 bit/sec. modem.

The optional external 3-in. floppy drive, which costs \$399, supports both 1.44M-byte and

720K-byte formats and includes a parallel port.

NEC also offers a card with 256K bytes of RAM (\$299) that can be used to store data or programs.

The Ultralite does not support an external keyboard or external numeric pad.

NEC has squeezed eight cur-



NEC's Ultralite laptop PC weighs just 4.4 pounds and fits inside a briefcase

sor-control functions into four keys, and a number of keys are half-height. However, the layout is well-planned, and the keys

*Continued on page 43*

### Lucid 3-D Version 2.0 adds a spreadsheet dimension

Dac Software, Inc. has released Version 2.0 of Lucid 3-D, a spreadsheet program that can run as a normal spreadsheet or as a memory-resident terminate and stay-resident program. In the latter case, it can be popped up over other applications such as Borland International's Sidekick. Its cut-and-paste feature lets you transfer data to and from the underlying application.

Aside from random-access memory residency, the real value of the product is its ability to work with multiple spreadsheets in up to nine overlapping windows. Any cell can contain data from any worksheet, and the linking can be done at an unlimited number of levels.

Lucid 3-D's capacity has increased significantly in Version 2.0. With Lotus/Intel/Microsoft Expanded Memory Specification, you can have worksheets with up to 8M bytes. There are rudimentary graphics in this upgrade but still no database features.

Lucid 3-D lacks string functions as well as some of the

more advanced analytical features such as goal seeking and regression analysis. It does provide 53 built-in functions, and it lets you develop your own.

#### Better compatibility

Compatibility with other programs has been greatly improved. Three RAM-resident programs provide direct read and write file compatibility with Lotus Development Corp. 1-2-3 worksheets, Ashton-Tate Corp. Dbase files and Dac's own accounting packages.

A batch conversion program for 1-2-3 is also provided. Lucid cannot, however, translate 1-2-



Lucid 3-D Version 2.0 works in up to nine windows

#### Lucid 3-D 2.0

Price: \$100

- Performance: Poor to very good
- Documentation: Very good
- Ease of learning: Good
- Ease of use: Very good
- Error handling: Very good
- Support: Poor to satisfactory
- Value: Excellent

3's macros: To convert two files in succession, we had to exit between conversions.

Graphics in Lucid 3-D require running a memory-resident graphics module. All data to be graphed must be contiguous on the worksheet. There is also a severe limit to the number of data points that can be graphed — a maximum of 32 columns and eight rows. There is no graph customization, and you cannot even adjust the scales.

If you include both horizontal and vertical orientations, you get a total of 13 graph types.

The product supports generic printer output only, but you can insert printer control characters and specify page breaks. For graphic output, the product

*To page 42*

the corresponding items appear on the right. Views can be built by file name, content, date or the application with which they work. In addition, views can consist of combinations of these categories. Views can span multiple hard disks or disk partitions and can contain other views. A collection of views makes up a domain, and you can have any number of domains available, though only one domain can be active at a time.

You can run applications on

## Viewlink

CONTINUED FROM PAGE 41

162-page user manual, an illustrated tour and a 56-page applications guide. The manual is confusing, and the on-line help rarely provided much assistance.

Installing Viewlink is an automatic process that takes about five to 10 minutes, depending on the number of applications and files on your disk.

Learning to use Viewlink will prove

## Lucid 3-D

CONTINUED FROM PAGE 41

supports only IBM-compatible dot matrix printers and Hewlett-Packard Co. LaserJet series printers.

Lucid 3-D has an impressive macro capability and is ideal for setting up turnkey applications. You can record macros from the keyboard and even insert macro commands and conditional statements while recording. Macros are stored in separate files and can be edited using a special macro editor. There is also a macro compiler, although the capability to develop user menus is missing.

### Easy link

With Lucid, linking individual cells from multiple worksheets is an easy process. Version 2.0 expands this concept by allowing you to link ranges all at once rather than one cell at a time. Despite the great linking capability, consolidating similarly formatted files is quite cumbersome because you cannot use external file references in formulas.

The product comes with a reference guide, a tutorial book and a quick-start guide for experienced spreadsheet users. The context-sensitive on-line Help is well implemented.

The tutorial provides everything you need to get up to speed. Even though the menu structure is different from the 1-2-3 standard, if you are experienced with other spreadsheets, then you can adapt to Lucid. Once learned, Lucid 3-D is very easy to use, especially if you have a mouse. The menus are structured so that you can see the full path of your command string. Shortcut keys that bypass the menus are also available.

### Save prompting

If you have unsaved data and attempt to exit the program, Lucid prompts you to save. An autosave feature saves your work at regular intervals when Lucid 3-D is active.

If you are running in RAM-resident mode and put the program aside to work on something else, there is a risk that you will lose your spreadsheet if you forget to save it.

Technical support is available Monday through Friday, 8:00 a.m. to 7:00 p.m. Central Standard Time. Dac provides 10 minutes of non-toll-free phone support during the first 60 days. Calls are answered by an automatic-routing system. After 60 days, a fee-based support program is available.

Lucid 3-D costs a little less than \$100. If you depend heavily on spreadsheet graphics and/or database features, you may want to look elsewhere, but with its increased capacity, Lucid 3-D will meet the needs of the vast majority of spreadsheet users.

troublesome to novices, which is not to imply that experienced users will be able to master it quickly.

At least Viewlink's user interface is well-designed. Once you become familiar with the menu layout, you can quickly whip up command strings using the highlighted letter in the menu options.

Application macros represent a key component of Viewlink and are used to execute programs with a particular data file. Unfortunately, you'll need the manual if you want to modify or add macros, and the manual offers an incomplete discussion of this process.

Pressing Alt-Q exits Viewlink with no verification required. No data will be lost, however, since any changes are recorded to disk immediately. If there is a power

**A**T LEAST VIEWLINK'S user interface is well designed. Once you become familiar with the menu layout, you can quickly whip off command strings using the highlighted letter in the menu options.

failure during some operations, files will not be closed properly, and Viewlink will warn you of this the next time you run it.

The automatic application macros can cause trouble. They override an application's normal use for keys. Another problem occurs if you attempt to record a macro using a name that already exists. The program provides no warning and lets you proceed, but the macro does not work.

Free — but not toll-free — phone support is available weekdays from 8 a.m. to 5 p.m. Pacific time. The technicians are helpful. Viewlink, priced at \$149.95, is a ground-breaking and useful product, but utility programs are generally designed to make life easier, not add another level of complexity. Viewlink requires a fair amount of additional work before it yields useful results.

He also doesn't realize  
Hewlett-Packard makes PCs.

That's unfortunate. Because Hewlett-Packard has a line of eight high-performance personal computers. PCs which range from desktop and floor-mount Intel386-based powerhouses to entry-level 8086-compatibles. PCs which offer you a better way of doing business.

Hewlett-Packard personal computers give you plenty of opportunity for expansion. As



The HP Vectra QS/20 PC. One in a line of eight PCs from Hewlett-Packard.

386 is a trademark of Intel Corporation  
© 1989 Hewlett-Packard Company CP-PC001

## Ultralite

CONTINUED FROM PAGE 41

that need to be oversized, such as Return, Tab, Backspace and Shift, are oversized.

The Ultralite documentation does a particularly good job of providing introductory information for the inexperienced user, but it is not nearly as good as a reference. There is no on-line Help system.

The weight and size of Ultralite are important pluses in ease of use; you can overlook a multitude of evils for a machine this small and light. In addition to the limitations of the keyboard, battery life, the need to make sure it is plugged in regularly and the obvious limitation in file-storage

capacity, this machine is lacking some of the options for external connections that are built into other machines. Depending on your specific circumstances, you may need to buy the optional parallel port. A built-in communications program would help during certain applications as well.

### Easy assembly

Setting up Ultralite is a snap. The total process takes about 15 minutes, which includes preparation of the RAM disk.

Ultralite feels more solid than most laptop computers. The cover for the external drive connector is about the only part likely to break; it tends to open easily and is readily knocked off its hinge.

NEC offers a one-year warranty for Ultralite.

### NEC Ultralite

Price: \$2,999

- Performance: Satisfactory to excellent
- Documentation: Good
- Ease of use: Good
- Setup: Very good
- Serviceability: Very good
- Support: Satisfactory to good
- Value: Good

tralite. Repairs must be brought or sent to an NEC-authorized repair location.

You can extend the original warranty for up to three additional years at an annual cost of \$299.90 for the 1M-byte version and \$369.90 for the 2M-byte version. These prices also include 24-hour

swap-out privileges.

NEC provides a toll-free support line that is answered by an electronic message-routing system. The service representatives are courteous and reasonably prompt.

While there are inevitable trade-offs in making a machine so small and light, anyone who needs to compute or communicate while traveling should consider the Ultralite.

Clearly, NEC's laptop computer is intended to provide the ultimate in size and weight savings but at a price.

At \$3,699 for the version with the 2M-byte RAM disk, the Ultralite costs roughly the same as NEC's Multispeed HD with a 20M-byte hard disk. The 1M-byte Ultralite costs \$2,999.

## Low-cost laser printer debuts

BY DOUGLAS BARNEY  
CW STAFF

NORWOOD, Mass. — Laser printers cost an awful lot of money because most are actually based on computers, often including their own CPU, random-access memory and storage capability.

Now the firm famous for helping to clone the IBM Personal Computer, Phoenix Technology Ltd., aims to lower that cost with a system that relies on the horsepower of a workstation to drive the printer.

The firm admits that its Phoenixpage system software for workstations may run a bit slower, but it argues that the cost savings will allow more users to have individual rather than shared printers. In fact, low-cost dot matrix printers can be used to print the more sophisticated Adobe Systems, Inc. Postscript output.

Unlike many proprietary printing systems, Phoenixpage supports a variety of printer control languages such as Postscript, PCL for the Hewlett-Packard Co. LaserJet printer and others, according to Phoenix. With the ability to emulate multiple systems, users can print compound documents that mix Postscript with other page description languages and imaging models.

Phoenixpage was originally aimed at the broader PC market, but growth in workstation power and sales as well as steadily declining prices convinced the firm to target that market as well. "There is a market for Postscript imaging in a more cost-effective environment," said Bob Downs, vice-president of Phoenix's peripherals business unit.

Phoenixpage is currently available to OEMs, which will remarket it for specific systems.

well as plenty of options. At the high end, you can get up to 8 accessory slots, 620 Mbytes of hard disk storage, and 16 Mbytes of RAM. And on all models, you get a choice of video solutions and the flexibility of using either 5.25" or 3.5" disks.

Beyond this, an investment in Hewlett-Packard PCs allows you to choose confidently from thousands of software applications and peripherals. HP's strict

adherence to industry standards insures compatibility. Now, and into the future.

But the most important feature, the one you won't get with any other personal computer, is Hewlett-Packard reliability. For 50 years, HP has promised, and delivered, exceptional quality in everything from calculators to HP LaserJet printers.

Finally, every PC made by

Hewlett-Packard is backed by an extensive network of trained, authorized dealers. For more information and the name of your nearest dealer, call 1-800-752-0900. You'll soon realize what an HP personal computer can do for you.

There is a better way.



## DISOSS

### DOCUMENT STORAGE REPORTER

Find out what's in your DISOSS library and PS/ICIS document pool.

- Reports on all documents
- Runs while DISOSS is active
- SMF accounting records
- Free 30-day trial



TBS Software Inc.  
249 Tempo Avenue  
North York, Ontario  
Canada M2H 2R9  
(416) 221-5140



## Barney

CONTINUED FROM PAGE 37

Microsoft apparently liked the resolve of this Bourne so much that they gave him a raise and bestowed on him the odd title of "Excel Push Team Leader." But Bourne still does the same thing — sells people on the concept that character mode is dead and that menus, dialog boxes, bit mapping and color are of utmost importance. Not everybody believes all this — yet.

Like any good soldier, Bourne has been ready for battle for years. His product has long been shrink-wrapped, tested, discounted and available. His biggest adversary, however, was this phantom product called Release 3.0. It is probably impossible to count the times people have said: "Hey, I'm waiting to see Release 3.0, and then I'll decide."

That is why he is so pleased that Release 3.0 is out the door. The phantom has materialized and can be put up against Excel. If the customer doesn't yet have a copy of Release 3.0, then Bourne and crew will bring one in, because they're those kind of people.

Most would be scared to know that Lotus is coming to town. So many have lost the battle of wills and smarts to the company from Cambridge with impeccable aim. Microsoft, though, has revenue of over \$700 million and more than 3,000 technically proficient bodies to throw around. They're set to fight, and by golly so is Lotus. Best clear the streets.

Despite the frustration of trying to displace an industry standard and being heavily outnumbered by Lotus troops, Bourne has had his sweet moments. Like the time he walked into an Egghead Software computer store and saw a man about to walk out the door with 1-2-3 under his arm. Bourne asked the man if he had seen Excel. After a bit of talk, the guy left — with Excel.

**Frozen solid.** Microsoft might not be afraid of Lotus, but I know of a mainframe spreadsheet vendor that is. According to a company marketing official, when Lotus announced its still-unshipped mainframe version of 1-2-3, about 12 good prospects immediately canceled. They thought the Lotus product was around the corner and didn't care that an existing product ran on 370s, read Lotus files and could handle something like 100,000 cells.

I think I've heard this complaint somewhere before . . . from another mainframe spreadsheet vendor.

**Dbase out of bounds.** Some companies who move to Unix pick one strategic version, then slowly move to others as markets and technology develop. That just doesn't cut it with Ashton-Tate. In the third quarter of this year, it should begin releasing numerous Unix versions of Dbase IV. In fact, the firm is working on some 20 different Unix versions, which will be distributed through OEM relationships. Look for a DEC Ultrix version to complement its VAX VMS product — which is already being demonstrated to key accounts — as well as versions for the NCR Tower line. Dbase IV is almost entirely C-based and is also largely developed on Unix-based systems from Sun, all of which eases the porting burden.

Barney is a *Computerworld* senior editor, PCs and workstations.

## PC foot

CONTINUED FROM PAGE 37

tion up and running, but the application isn't fully utilized because they are going through a culture shock," said Frank Giroux, manager of technical support at Boston Edison Co. in Boston.

"They are not prepared to deal with the initial shock of when the application is first put to use. But we find that over time they mature and come to understand the application and use it fully," Giroux said. What follows is a "renaissance of enthusiasm," he added.

End users who have gone through the initial experience of adopting an application are more ready to take on additional

applications and get up to speed much faster, Giroux said: "At first they are overwhelmed, but then they buy into the idea of what it means to automate."

### Over time

End users eventually become adept at using their applications to the fullest if given adequate training and time, several managers said. Requiring end users to justify ahead of time how they plan to use specific applications also helps to maximize use because it requires commitment on their part to carry through with the rationale for purchasing an application, they said.

"Our attitude is that if they can demonstrate any need in buying, we're going to be in favor of it because we feel that it is a step in the right direction," Wasserman

explained. "We have implemented certain buying practices where they have to justify and demonstrate need. We're also attempting to follow up. When we find that they are not using the application to capacity, we schedule training programs."

Training is part of the solution, although it also helps to have the support of management for the implementation of certain applications, Giroux pointed out.

"If end users perceive that it's an IS application, their learning goes slowly. But if it's an end-user-driven application that management wants, it goes much faster," he said. "In our organization, many applications are driven by end users and are supported at the highest echelons so that there is accountability and justification for the applications."

# GOOD NEWS



*The results are in, and not one, but four of the industry's leading publications name Multi-Tech as the modem of choice.*

Magazine editors and corporate buyers alike put nearly every modem on the market under close, demanding scrutiny.

*"Solid buy" ... "Top performer" ... "Slew of extras" ... "Well built" ... "The price is right" ... these are phrases used by reviewers to describe the Multi-Tech MultiModem.*

Editors at PC MAGAZINE in a review of 87 modems chose Multi-Tech for their Editor's Choice. Corporate buyers surveyed by PC WEEK gave Multi-Tech their highest scores for quality, overall performance and organized documentation. INFO WORLD, in detailed line impairment testing, named Multi-Tech the unquestionable "top performer." And results of the DATA COMMUNICATIONS Datapro User Review prompted editors to comment, "It's no wonder that Multi-Tech's performance and market share continue to grow."

Reprinted from PC Magazine, May 12, 1987. Copyright © 1987 Ziff Communications Company. • Copyright 1988 by InfoWorld Publishing Corp., a subsidiary of IDG Communications, Inc. Reprinted from InfoWorld • Reprinted from PC Week, March 6, 1989. Copyright © 1989 Ziff Communications Company. • Reprinted from October 1988 Data Communications. Copyright 10/88 McGraw-Hill, Inc. All rights reserved.

## Fileshare smooths the information search road

BY DOUGLAS BARNEY  
CW STAFF

BELLEVUE, Wash. — Start-up Saros Corp. recently announced Fileshare, a system that allows local-area network users to search for information and share files.

The system, which supports a variety of LANs and operating systems, is aimed at easing the task of finding files via graphical query tools and allows multiple users to work on individual files with version control.

Files can be sought without having knowledge of server, path or file name; in-

stead, a user needs to supply either a name, topic or date. In addition, users can search for files across multiple LAN file and database servers.

Fileshare works with text files, worksheets and database files. It can also work with files without loading the application that created them. The product stores files so they can be transparently accessed by a number of PCs and locates them in areas specified by a network administrator.

The system includes a portion of the Ashton-Tate/Microsoft SQL Server for querying but does not require a database server to operate.

In addition to its client/server architecture, individual servers can also communicate, according to company Chairman Wayne Carpenter.

The system uses Microsoft Corp.'s Windows as its user interface and supports MS-DOS workstations, OS/2-based servers and any network that uses the Named Pipes applications programming interface.

Fileshare is currently available and costs \$425 per workstation. Discounts will be based on volume.

The system is the first in a series of products aimed at data sharing and workgroup-style applications.

## Library

CONTINUED FROM PAGE 37

year, said Fleischhauer. He noted that the library has proceeded slowly on the project partly because it had to wait for the right technology and because of the immense task of cataloging its collections.

Fleischhauer added that the library has submitted to Congress an initial budget request for about \$1 million in funding.

A collection that may be included in the automation project is a large volume of photographs from Detroit Publishing Co., which at the turn of the century amassed a collection of scenic photographs from all over the country. The library's prints and photographs division has more than 12 million items in separate photos and prints, Fleischhauer noted.

"These are in many ways the hidden treasures of the library," Fleischhauer

**T**HESE ARE in many ways the hidden treasures of the library. You can get a book, but there's no way to get many of these manuscripts and archival collections."

CARL FLEISCHHAUER  
LIBRARY OF CONGRESS

said of the photo and print collections. "You can get a book, but there's no way to get many of these manuscripts and archival collections."

"The question is, how do we make these available? In the past, people have come here and looked at them. And the library has in the past prepared them on microfiche."

The library will initially use Macintosh SE microcomputers with Apple's Hypercard as a database linked with compact disk and videodisk players from Pioneer Communications of America, Inc. and Sharp Electronics Corp. The prototype uses the analog videodisks for storing still photographs and prints and uses an Apple scanner to scan certain digitized information into the system's Hypercard database stacks.

The project's planners, however, do not have a preferred method of handling audio. Nevertheless, Fleischhauer said they are exploring technologies such as compact disk/read-only memory/extended architecture (CD-ROM/XA), compact disk interactive (CDI) and digital video interactive (DVI). Fleischhauer said "CD ROM/XA, CDI and DVI all show promise, and we're interested in any other way somebody wants to cook a compact disk."

Fleischhauer, who characterized the library's current prototype as "conceptual," said the system should be neutral in terms of operating systems. He added that the organization would like to offer the collections for MS-DOS and Unix. "We certainly want to reach a lot of people, so we're very oriented toward microcomputers, affordable displays and printers — and that makes us think of optical disks. Compact disks, and even analog videodisks, are frightfully efficient today. We're going to keep an eye on things because something tomorrow may be even more efficient. In the long run, we'd like to see a lot of this on-line."

# MULTIPLIES

Data Communications

“  
Report  
Card's Out—  
Multi-Tech Scores  
3.56 Out of 4.0.  
”

Wouldn't you like to add some good news to your network?

We think you'll gain a multitude of benefits by adding Multi-Tech to your communications system. And judging from these reviews, the experts think so too.

Call us today at 1-800-328-9717 and we'll send you the full reprints of these reviews. We'll also include information on all of our modems, multiplexers and other datacomm products... just to prove that good news really *does* multiply.

**MultiTech**  
Systems

The right answer every time

Multi-Tech Systems, Inc.  
2205 Woodale Drive  
Mounds View, Minnesota 55112 U.S.A.  
(612) 785-3500 (800) 328-9717  
U.S. FAX (612) 785-9874  
International Telex 4998372 MLTTC  
International FAX (612) 375-9460

## Cops pound faster beat with on-line system

BY SALLY CUSACK  
CW STAFF

When Chief Willie Ray of the Cordele, Ga., police department wants to know where to beef up patrol coverage in town, he consults a daily activity sheet generated by the department's database management system.

The police department uses the PDAS (Police Department Administration System) version of Filepro, a Unix-based database manager offered by The Small Computer Co. of Hawthorne, N.Y.

The chief has divided the town of 14,000 residents into several zones and uses the software's statistical reporting function to break down crime occurrences by time, zone and type to track areas of high, low and moderate activity. Ray said this allows him to use his available manpower effectively.

The department purchased Filepro two years ago. It currently uses two terminals, a Wyse Technology 60 and an IBM 3270-type unit.

Both are linked to a host IBM Personal System/2 Model 60 running SCO Xenix 3.2. The police chief said that ideally, the force could use another terminal dedicated solely to name-searching functions.

### A stitch in time

The software has proved to be a time-saver when locating court papers, dockets and related reports, Ray said.

"We used to have to pull down the

**W**E USED TO have to pull down the books and search through the records. Now we just enter a name, and the information appears on the screen."

CHIEF WILLIE RAY  
CORDELE, GA., POLICE  
DEPARTMENT

books and search through the records. Now we just enter a name, and the information appears on the screen," he said.

The PDAS system is now installed in approximately 10 police departments throughout Georgia, according to application developer Jim Clarkin of Small Computer's Roswell, Ga., office.

The 13-year-old company offers a variety of vertical applications based on the Filepro system, according to Clarkin. These include medical office systems and financial applications as well as programs customized especially for real estate brokers, funeral homes, day care centers and hotels.

Alice Gilliard, records clerk at the Douglasville, Ga., police department, has been using the PDAS program since 1985.

Gilliard said it was purchased to accommodate the tremendous amount of paperwork generated by the court system. The Douglasville department evaluated several hardware systems, including those from IBM, but eventually settled on a Tandy Corp. Tandy 6000.

The Tandy 6000 is currently equipped with one 35M-byte and one 70M-byte

hard disk and runs in conjunction with three Tandy DT-100 computers. Of the 40 or so municipal employees, two full-time and one part-time person are using the software.

All court traffic tickets, related depositions and dockets as well as complaint and incident reports and officer's logs are entered into the system each day. The PDAS program also provides a history file, kept by name, that maintains a record of all persons coming in contact with the police.

Incident reports, at least those of a criminal nature, are compiled and sent to state public safety officials on floppy

disks, Gilliard said. The only problem Gilliard encounters rests with the hardware, not the software.

### Pick it up

"We need a little more speed," she says. "That 6000 is awfully slow; it takes us two or three days and about 30 diskettes to do backup."

Douglasville is hoping to upgrade to an Intel Corp. 80386-based machine, and Clarkin will handle the conversion and enhancement requirements.

Clarkin provides support to all his clients via a dial-up modem and said that most problems that might possibly occur

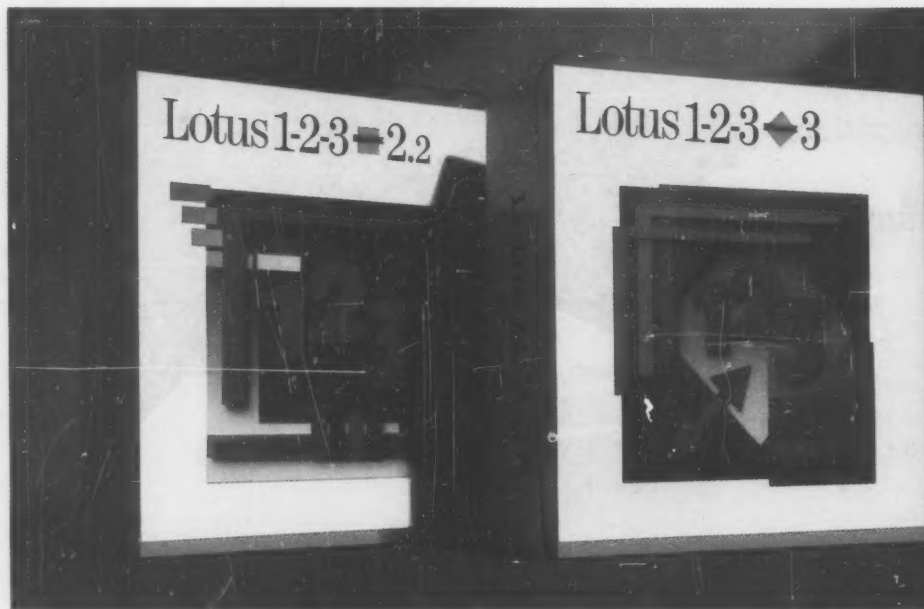
can be resolved on-line.

Filepro software reportedly offers a maximum of 999 fields per record and provides file- and record-locking capabilities. Full-screen editing capabilities and on-line Help functions are also included, the company said.

The program can be configured to run in MS-DOS and PC-DOS operating environments and requires 400K bytes of random-access memory, according to the vendor.

A complete PDAS system costs \$10,500, which includes 40 hours of on-site installation, training and support. According to Clarkin, there is a 120-day warranty on the product, after which clients can purchase the dial-up modem service contract for \$1,000 per year.

## Lotus introduces so sleep better at ni



Spreadsheets are like lots of things in life, one size doesn't necessarily fit all.

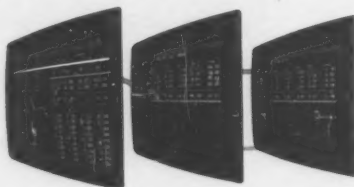
Different users work with different types of computers. They work on different tasks. And they have different requirements.

That's why Lotus® has created two exciting new spreadsheets: 1-2-3® Release 3 and 2.2. Each designed specifically to maximize

performance on different types of PCs and work together across different types of PCs.

Release 3 is nothing short of a breakthrough in software technology. Its new, true three dimensional design lets you organize, analyze and navigate your way through spreadsheet applications with incredible speed, power and ease.

What is it that makes Lotus's true 3D different?



Release 3's 3D design lets you work with multiple sheets and files simultaneously.

© 1989 Lotus Development Corporation. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. OS/2 is a registered trademark of IBM, Inc. Macintosh is a registered trademark of Apple Computer, Inc. 1-2-3 Release 3 runs under DOS or OS/2.



## Project management system par for the LPGA course

BY RICHARD PASTORE  
CW STAFF

TOLEDO, Ohio — Organizers of the Jamie Farr LPGA Toledo Classic golf tournament are steering clear of sand traps with the help of a project management system from Primavera Systems, Inc. in Bala Cynwyd, Pa.

Fifty-two committees and 1,100 volunteers are scrambling to organize the annual Ladies Professional Golf Association

(LPGA) tournament, to take place here July 3-9. Each committee consists of subcommittees whose members are responsible for hundreds of tasks. Helping to keep track of it all since Feb. 1 are Gantt charts generated by Primavera's Project Planner software package and Primavision graphics system.

The charts depict color-coded time lines labeled with the volunteer's name and the specific tasks for which he is responsible. Typical activities charted in-



clude contacting and recruiting volunteers, confirming schedules, mailing instructions and ordering uniforms.

Toledo-area project management consulting firm PMCI, Inc. is responsible for operating the system on its personal com-

puter compatibles.

"The charts have enabled our committee chairmen to map out exactly when their tasks should be completed by," Tournament Director Judd Silverman said. "It's really helped them to be able to look down at the chart and see that they've got to get this done by such and such a date."

This is the first year that the tournament has fully used the system; in previous years, organizational planning was done with pencil, paper and lots of erasers. The change has "helped the overall coordination come together quicker and more efficiently," Silverman said.

Debbie Monagan, chairman of the Events Committee and a tournament volunteer for the last five years, agreed that the Primavera system has improved efficiency.

"I have 18 subcommittees, and it's very difficult to keep on top of all of them," Monagan said. "But now, there's no question about what needs to be done. It's forced us to be very organized."

The system also provides for a consistent approach in years to come, according to Patricia Ajemian, chairman of the Players' Services Committee. "I think that the benefits will be more realized as each year approaches," she said. As newcomers join the volunteer corps, they can look at charts from the previous year and see when they need to begin tasks in order to complete them by the start of the tournament.

After the tournament, PMCI and tournament officials will evaluate this year's charts for accuracy in meeting the specified time deadlines.

# Something to help you get. Fitted sheets.

Well, other spreadsheets provide two axes for you to work with: rows (height) and columns (width). But Release 3 gives you a third axis (depth). So you can perform operations using any spreadsheet function *through* up to 256 worksheets simultaneously.

Equally impressive is Release 3's presentation quality output and its selection of advanced analytical graphics. And its Data External command lets you bring data from external databases directly into your spreadsheet without leaving 1-2-3.

You can also create a wealth of customized applications from simple forms to sophisticated turnkey systems using the new Lotus Add-In Toolkit for Release 3.

Release 3 is available now for DOS or OS/2\* users and is the one product designed to take full advantage of the 1 Mb memory and processor that is standard on today's 286 and 386-based PCs.

We've also created a new version of 1-2-3 for people who work on all types of PCs in a 640K DOS environment.

The soon-to-be-released 1-2-3 2.2 is designed to maximize the memory of those PCs. Release 2.2 provides extraordinary speed as well as presentation quality output with Allways built-in. And Release 2.2 offers improved

analytical power in the way of spreadsheet linking, undo and minimal recalc.

Plus, hundreds of add-in and companion products that work with the 1-2-3 you're using now will work with Release 2.2.

1-2-3 2.2 and 3 provide the highest compatibility with your present 1-2-3 files, macros, applications and with each other. The new 1-2-3 family offers full networking capabilities and because the new products use

the familiar 1-2-3 menu, it protects your investment in training and support.

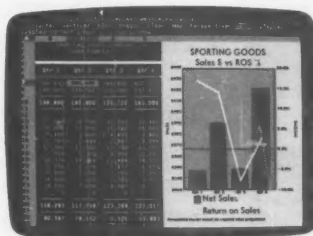
Lotus plans to maximize your investment in the future by introducing 1-2-3 for mainframes, workstations, OS/2 Presentation Manager and Macintosh.\*

Offering your company's computer users maximum performance on their respective PCs is a big part of your job. Seeing that it all works together in harmony is a big part of our job.

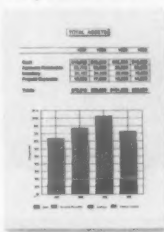
And that should help you get a good night's sleep.

## The New Lotus 1-2-3

*The spreadsheet of choice*



Release 3's HotView graph window dynamically links your worksheet and related graph.



Release 2.2 offers presentation quality output and extraordinary speed.

Hard disk and 1 Mb system memory required in DOS, 3 Mb in OS/2. Lotus certified compatible PC with 80286/80386 processor required. Release 2.2 runs on PCs of all types with a minimum of 528K system memory, 512K and hard disk required with Allways.

## NEW PRODUCTS

### Systems

Goldstar Technology, Inc. has made available a laptop-size desktop computer "executive workstation."

The Goldstar GS500 IBM Personal Computer AT-compatible is compact, weighs 16 pounds and has an Intel Corp. 80286 CPU, IBM Enhanced Graphics Array-compatible plasma display; 3 1/4-in., 1.44M-byte floppy disk; 20M-byte hard disk; and serial and parallel ports.

The PC runs at 8 or 12 MHz, includes 640K bytes of random-access memory and has a socket for an Intel 80287 math coprocessor, the vendor said. The price is set at \$3,895.

Goldstar Technology  
1130 E. Arques Ave.  
Sunnyvale, Calif. 94086  
408-738-8388

### Macintosh products

Microtech International, Inc. has extended its customer support platform for Apple Computer, Inc. Macintosh users.

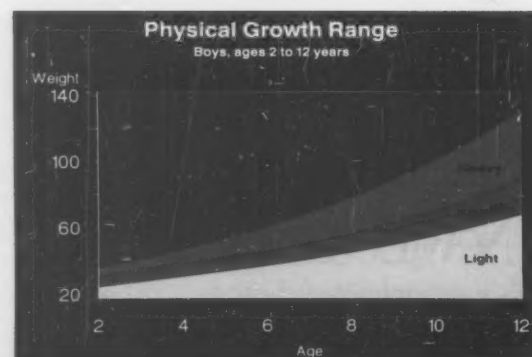
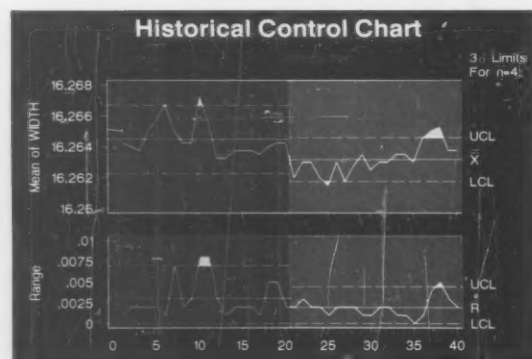
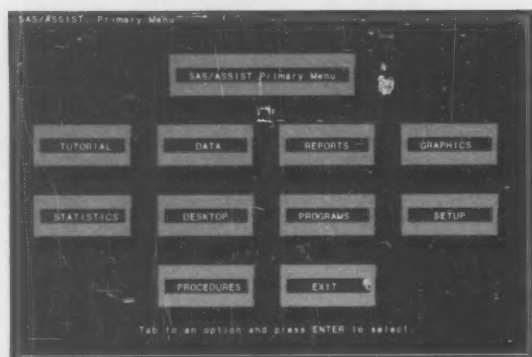
The Step Up Expansior Program reportedly permits users to trade in hard disks from virtually any Mac manufacturer for Microtech's Nova series of internal and external removable hard disk drives.

The company is reportedly offering rebates of up to \$200 on trade-ins and is accepting hard drives regardless of working condition.

Microtech International  
29 Business Park Drive  
Branford, Conn. 06405  
203-488-7744

# The SAS System

## More Choices, for More Applications, than Any Other Software.



The SAS System is the software you'll never outgrow. No other software offers so many choices for data management, analysis, and presentation. For any user—new computer user to seasoned pro. For any environment—PC to technical workstation to minicomputer to mainframe.

**Choices to Build On.** Start with a powerful English-like language and essential data management tools. Then take your pick of ready-to-use applications: statistical and mathematical analysis...report writing and color graphics...project management and quality control... forecasting and decision support.

Or build your own menu-driven applications—quickly and easily—with the SAS System's interactive applications development tool. Even first-time users can command the power of the SAS System... just by filling in the blanks.

**Choices to Count On.** More than a million users throughout the world—in business, industry, government, science, and education—have made the SAS System their #1 choice for data analysis and color graphics. And every SAS System application is backed by expert technical support, documentation, and training.

We'll tell you more in a free 12-page executive summary. Just give us a call at (919) 467-8000. In Canada, call (416) 443-9811.



SAS Institute Inc.  
Software Sales Department  
SAS Circle ☐ Box 8000  
Cary, NC 27512-8000  
Fax (919) 469-3737

The SAS System runs under IBM Corp.'s MVS, CMS, and VSE; Digital Equipment Corp.'s VMS; Data General Corp.'s AOS/VS; Prime Computer, Inc.'s PRIMOS; Sun Microsystems, Inc.'s SunOS; Hewlett-Packard's HP-UX; Microsoft Corp.'s MS-DOS; and IBM Corp.'s PC DOS.

Copyright © 1986 by SAS Institute Inc. Printed in the USA.

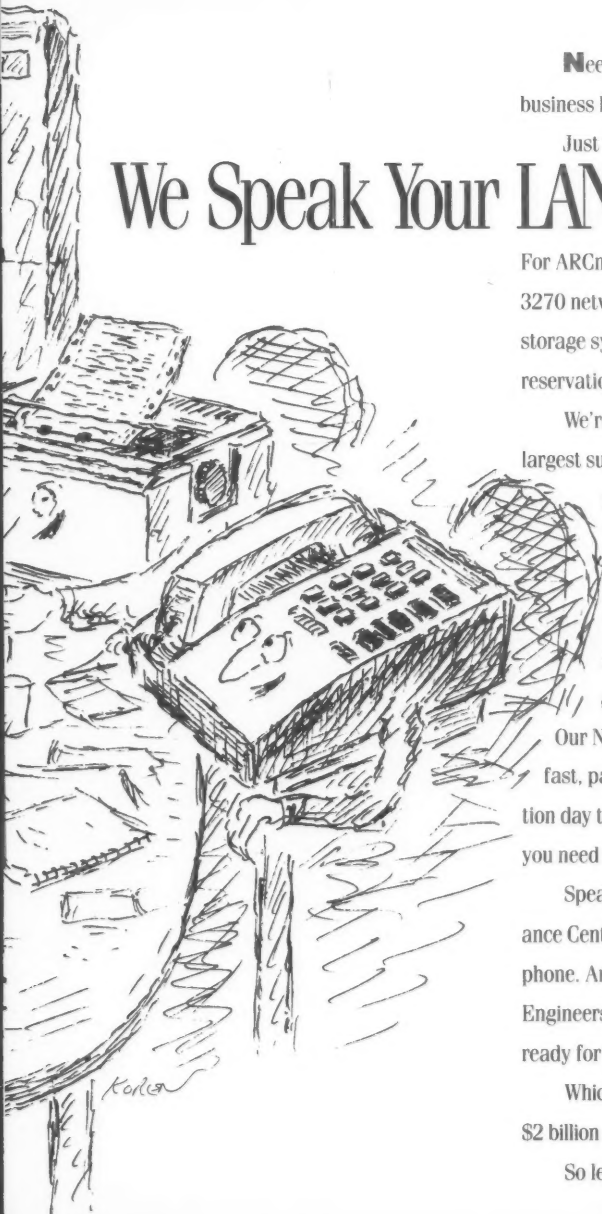
We  
Speak  
The  
LANguage  
Of  
Business.™



**MEMOREX TELEX**







**N**eed systems integrators fluent in your business language?

# We Speak Your LANguage.™

Just speak up. We'll listen to you, we'll understand you and we'll deliver solutions. For ARCnet, Ethernet and Token Ring LANs, for 3270 networks, for midrange systems, for large storage systems and even the most exotic airline reservation systems.

We're the people of Memorex Telex, the world's largest supplier of plug-compatible computer products, accessories, service and support.

For starters, we engineer, manufacture or source virtually any product you could need. Systems Engineers then design and integrate custom solutions for your business.

Our Novell®-certified instructors train users for fast, painless startup. We're there from installation day to maintenance day and every other day you need us.

Speaking of needing us, our Technical Assistance Center offers you remote data acquisition by phone. And if they can't fix it, our 1300 Customer Engineers are based at 260 strategic U.S. sites, ready for 24-hour/7-day dispatch to your door.

Which wraps up a full-service package only a \$2 billion company can talk about... *in your language.*

So let's talk.

## 7070 NETWORK SERVER

## 7045 INTELLIGENT WORKSTATION

## 7040 INTELLIGENT WORKSTATION

# Intelligent Systems Series



The **7045 Intelligent Workstation** gives you full desktop capacity in a smaller package. We integrated video support and diskette control in the base system to give you six expansion slots for a full range of communications or other options. Standard 1MB of RAM and 80286 operation at 8/12MHz or 8/16MHz. The companion **7065** offers 16MHz or 20MHz 80386 microprocessing, making either unit a high-performance solution for a LAN, as a LAN server, or standalone.

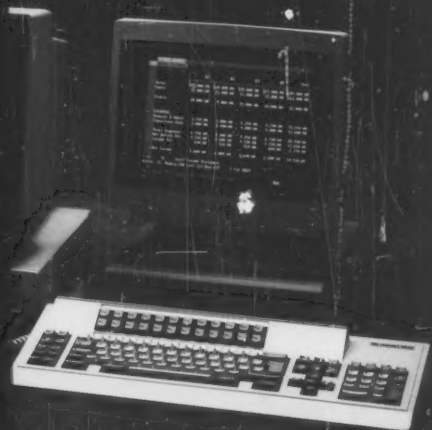
Powerful performance perfect for the most demanding LAN server and high-end multi-user applications. The 20MHz **7070 Network Server** delivers up to 16MB of RAM with five available storage bays for total flexibility. Effortlessly supports leading network operating systems and can platform complex CAD/CAM/CAE programs.

A low-profile but highly-integrated 80286-based workstation. The **7040's** built-in functionality leads competitors with integrated video and floppy disk support, SCSI fixed-drive interface and a mouse port. Switchable 8/12MHz and three expansion slots make this compact performer readily expandable and adaptable for a variety of applications.



**7025 INTELLIGENT  
WORKSTATION**

# Token Ring LANs Ethernet Arcnet



The industry standard for packing big 12MHz performance in a small footprint. An excellent solution for both LAN or standalone applications, the **7025 Intelligent Workstation** also features integrated disk and video controllers, providing two expansion slots for add-in adapter boards.

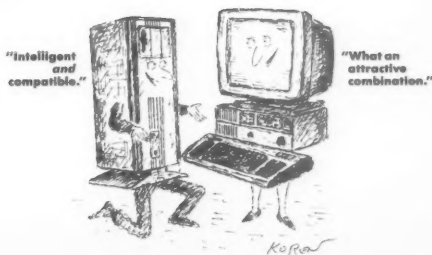
The Memorex Telex Intelligent Systems Series gives you a single source for a complete line of state-of-the-art workstations.

For LANs, WANs, or as stand-alones. With full connectivity for 3270 and midrange systems. For airlines systems and travel applications, Memorex Telex integrates ALC solutions and customizes them to meet end-user requirements.

We've selected our most reliable plug compatibles. Then increased performance, streamlined profiles and integrated functions, and expanded flexibility to offer you unmatched versatility in systems solutions.



Then you get added value on top of this added value. With expert consultation, design, installation, user training and customized support. All of which makes Memorex Telex the hardware systems integrator you need to speak your LANGUAGE.



**5460 TAPE  
CARTRIDGE SUBSYSTEM**

**3261/81T TAPE SUBSYSTEM**

**1197-D/W2  
DISPLAY STATION**

**1224 PRINTER SERIES**

**1197-C2 COLOR  
DISPLAY STATION**



An ergonomic and highly functional display available with green, amber or black-on-white 15" monitor, the **1197-D/W2 Display Station** is capable of 3,650-character display and split-screen mode. Supports up to three concurrent sessions (two displays and one printer) and 83-, 102- or 122-key keyboards. Features print trim, host-addressable printing and support of twisted pair or twinaxial cabling.

The **1224** series of intelligent 4224-compatible desktop matrix printers utilizes the advanced functions of IPDS support such as graphs and barcodes. 256K or 512K memory. Handles 250 or 400 cps in one, four or eight colors and offers versatile paper-handling capabilities.

Offering brilliant, two- or seven-color display modes, the **1197-C2 Color Display Station** supports up to three concurrent sessions (two display and one printer) and four terminal modes. Use with 83-, 102- or 122-key keyboards. More features include print trim, host-addressable printing, and support of twisted pair or twinaxial cabling.

**1196 A/B  
DISPLAY STATION**

# S/3X and AS/400™ ENVIRONMENT line of plug-

compatible products for S/3X and AS/400 environments. Period.

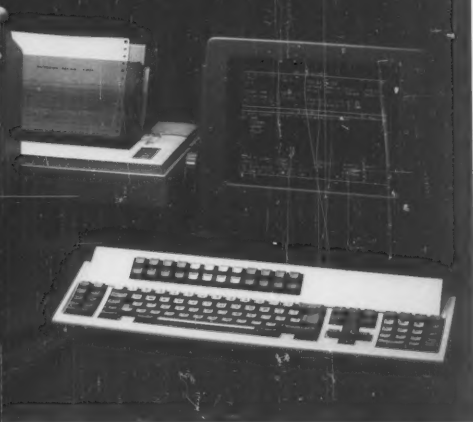
That means everything you want, from nobody else.

Personal systems and workstations. Display stations. Impact and non-impact printers. Systems printers. Disk and tape storage devices. Add-in memory and other system upgrades.



Many we R&D ourselves. Others we OEM-source and enhance. All of them we continually evaluate and upgrade to give you uncompromised quality, reliability and performance. Today, tomorrow, and well into the next century.

Which, for midrange users, is good news in any language.



Introducing state-of-the-art storage that's 100% compatible with the 3480 standard. Configured with an automatic cartridge loader, the **5460 Subsystem** can back up more than two gigabytes of data without operator intervention.

The **3261/81T Subsystem** is the midrange industry standard for save/restore operations. Fully compatible with 3422 and 3430 tape systems, it offers densities of 1600/6250 bpi with data transfer rates from 200kb to 1250kb per second.

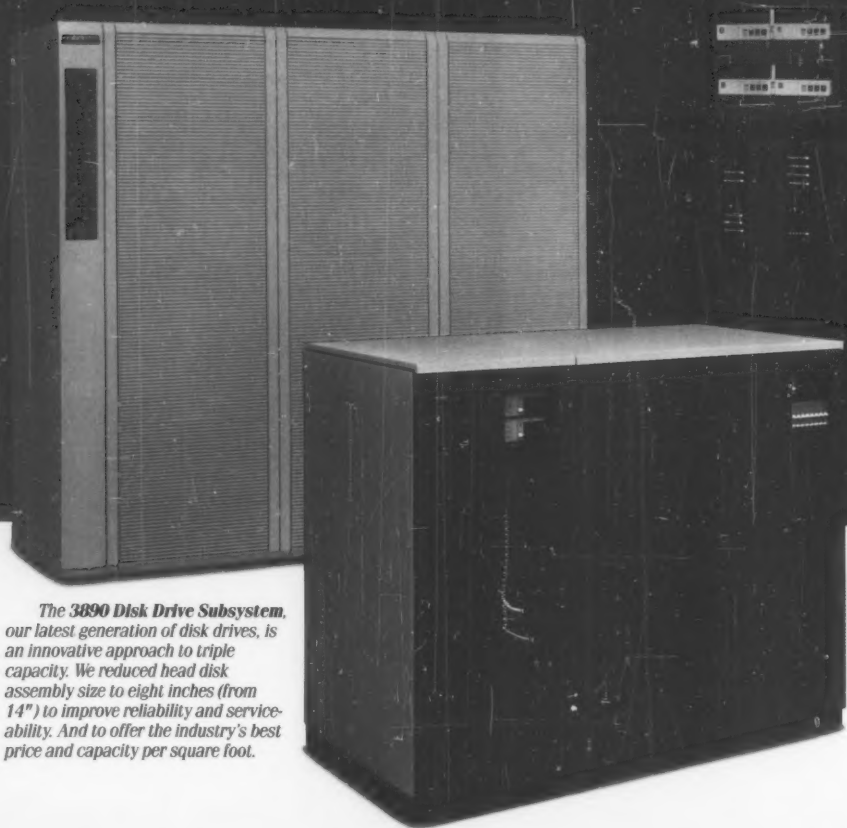
The **1196 A/B** full-function 12" Monochrome Display Station features a choice of 83-, 102- or 122-key keyboards as well as host-addressable print support. Supports twisted pair or twinaxial cabling.





### 3890 DISK DRIVE SUBSYSTEM

### 6090 SOLID STATE SUBSYSTEM



*The 3890 Disk Drive Subsystem, our latest generation of disk drives, is an innovative approach to triple capacity. We reduced head disk assembly size to eight inches (from 14") to improve reliability and serviceability. And to offer the industry's best price and capacity per square foot.*

**5480/SP2 CARTRIDGE  
TAPE SUBSYSTEM**

# Large Storage SYSTEMS

**Who** packs more facts in a square foot than anybody? Memorex Telex.

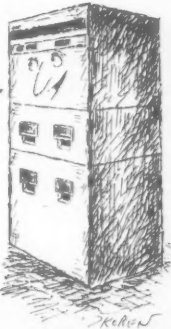
We pioneered our first disk drive storage unit a generation ago. And each succeeding generation of Memorex Telex devices — from tape to solid state to cartridge robotics — has meant more cost-effective storage, processed faster, easier to expand, and simpler to operate.

All with floorspace savings that crowd neither computer rooms nor budgets.

But hardware is just the beginning. Our Customer Engineers and support teams are peripheral, channel and mainframe-trained. From the first analysis to the last test run, you'll get the seasoned systems service you need in your nonstop, real-time environment.



*We're building on the success and reliability of the **5480 Cartridge Tape Subsystem** with a simple, space-saving idea: stack them! This **5480 Special Package** offers the highest capacity-per-square-foot in the industry, and sets new standards for ease of operation and maintainability. New robotic options vastly increase data handling flexibility and speed.*



"Any questions?"

1Mbit semiconductor storage technology makes the **6890 Solid State Subsystem** high-performance system perfect for critical, frequently-accessed data. Solid state means no moving parts and no seek time. Its thousands of operations per second boost user productivity. Holds both temporary system files and permanent production data.

## 1174 NETWORK CONTROLLER

## 1324 COAX MATRIX PRINTER

## 1192 ENHANCED FUNCTION DISPLAY



The highly-reliable choice for high volume printing, the **1324 Coax Matrix Printer** is rugged, supports IPDS and is user-friendly. Forms modules make swap-outs fast and keep paper alignment perfect. Handles four- and eight-color printing. Best of all, its LCD message center speaks in English, not cryptic codes.

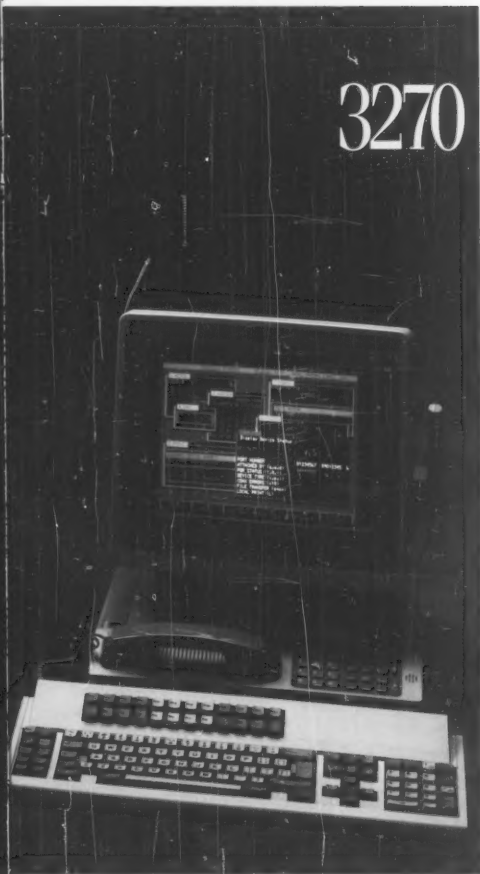
A versatile networking platform in 3270 environments, the **1174 Network Controller** offers user benefits that go far beyond current standards. Supports up to 96 devices and up to four 3270 hosts at once. So you'll get cost savings and greater flexibility in network processing, with 3270 and asynchronous communication combined with Token Ring-based networks. A totally new set of standards for connectivity and networking reliability.

With an array of screen sizes, specialized keyboards and a new modular design, the **1192 Enhanced Display** series launches an era of enhanced operator productivity. These displays offer features you can't find on other 3270 products — programmable-base colors, field marking for clear identification of data entry fields, screen sizes up to 132 columns, on-screen calculator functions and local screen print capability for easy deskside copy.



**C19A COMBINED  
FUNCTION TERMINAL**

# 3270 NETWORKS



**The C19A Combined Function Terminal** provides desktop automation tools that dramatically enhance operator productivity. This 3270 plug-compatible terminal provides multiple data communications, extensive windowing capabilities, inboard applications and integrated telephone features. That means operators conduct more calls, quickly and accurately update system information and automate repetitive tasks. Nobody combines functions better.

Perhaps nowhere is the Memorex Telex commitment to value-added innovation more evident than in our 3270 market displays, printers and controllers. And no one can touch us.

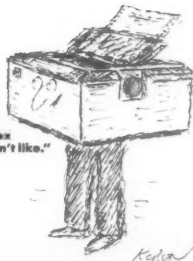
It's a simple and successful formula: We listen to our customers, anticipate their needs, and deliver solutions. Year after year.

The result is an extensive family of products for the 3270 application environment that creates an industry standard. A complete range of displays, from basic to multi-function. Controllers for simple or advanced networking applications. New laser printers that attach to 3270 controllers, PCs and LANs simultaneously.



All 100% plug compatible. And all 100% conversant in your business language.

"Compatible?  
I never met a  
Memorex Telex  
terminal I didn't like."



Memorex Telex is the world's largest supplier of plug-compatible computer products and supplies, and enjoys a proud reputation for innovation in the telecommunication and computer industry worldwide.

Let us prove our fluency in the LAnguage of your business by returning the card below.

The  
LANguage  
Of  
Business.™



**MEMOREX TELEX**

*We speak the LAnguage of business.™*

**P**lease send me more information about:

- |  |                                       |
|--|---------------------------------------|
| <input type="checkbox"/> Intelligent Workstation Products      | <input type="checkbox"/> CFT Products |
| <input type="checkbox"/> S3/X and AS/400™ Environment Products | <input type="checkbox"/> Controllers  |
| <input type="checkbox"/> Large Storage Systems                 | <input type="checkbox"/> Printers     |
| <input type="checkbox"/> 3270 Network Products                 | <input type="checkbox"/> Other _____  |

NAME \_\_\_\_\_  
TITLE \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

4343 S. 118th East Avenue  
Tulsa, OK 74146  
1-800-950-3465

Memorex Telex is a trademark of Memorex Telex, N.V. Specifications subject to change.

# NETWORKING

## DATA STREAM

Jeffrey N. Fritz

### Users share ISDN wealth



Companies looking for a good reason to install Integrated Services Digital Network technology

should check out screen-sharing, or the ability for users on two or more personal computers to view and, in some cases, interact with one another's programs. Besides being one of the more interesting ISDN applications, screen-sharing can significantly boost user productivity.

Most users are familiar with file transfer and interactive chat screens provided by many telecommunications programs. Screen-sharing is different. Two users, even if they are in different locations, can simultaneously work on a "work group" document. Since ISDN offers relatively fast data transfer rates, up to 64K bit/sec., information flow between computers is nearly instantaneous.

Throw in the benefit of voice communication provided by ISDN, and screen-sharing takes on a new dimension. Even though they may be miles apart, users can enjoy the same benefits as they would seated together at the PC.

Remote access packages such as Carbon Copy Plus by Meridian Technology and PC Any-

*Continued on page 54*

## Rockwell takes ISDN plunge

Features such as modem pooling result in substantial cost savings

### ON SITE

BY ELISABETH HORWITT  
CW STAFF

RICHARDSON, Texas — Rockwell International Corp. recently dipped its toe into ISDN waters, installing a simple, Centrex-like network that provides basic cost-reduction through modem-pooling and other simple measures. But the holding company is still evaluating more ambitious applications for the telecommunications technology, awaiting developments that will make implementation more feasible, according to two telecommunications managers who oversaw the initial installation.

At Christmas last year, Rockwell's Network Transmission

Systems Division campus cut over from Southwestern Bell Corp.'s analog Centrex service to an Integrated Services Digital Network version. Among the ISDN features used by the division are voice/data integration and modem pooling.

Pooling of 9.6K bit/sec. Micom Systems, Inc. modems eliminates the need for separate lines out to the host. Data terminals transmit over the ISDN D channel — an X.25 packet-switched

connection — to the modem pool at Southwestern Bell's switch and then out over an analog line to the host.

A benefit of ISDN links is the ability to send at 9.6K instead of 1,200 or 2,400 bit/sec., said Charles Covey, telecommunications specialist at Rockwell.

ISDN provides voice/data integration by eliminating the need for separate lines — one for voice, one for an analog modem. "Now we have the same functions with the



Rockwell's Tilbury

networks said the firm believes the Soderblom patent is not applicable to the 802.5 Token-Ring technology and claimed other OTF members have yet to reach agreements with Soderblom.

Apollo's decision to settle is not relevant because it does not use standard 802.5 technology, the spokeswoman added.

Metcalfe and other OTF vendors believe Soderblom's patent claims are slowing the growth of Token-Ring by creating a barrier to lower adapter costs.

"Part of what we face in bringing down the cost of node connections is that you have to pay a royalty; this is not the case with Ethernet," said Bill Swift, 3Com's product line manager for Token-Ring products. 3Com is a supplier of both Ethernet and

same telephone number. It's like voice-over-data but cleaner," Covey said.

Rockwell is interested in using ISDN to link incoming customer calls with a computer database containing customer records, Covey said. This would require a far broader implementation of ISDN among different carriers, as well as support of Signaling System 7, the ISDN protocol for transmitting key information such as caller identification among different carriers' systems, he added.

There are several ISDN applications that Rockwell has decided not to implement yet. One is circuit-switched data, which would allow data transmissions to run over the 64K bit/sec. B channel rather than the 16K bit/sec. D channel of an ISDN Basic Rate Interface.

It sees no need for higher speed terminal-to-host connections, given that the host cannot

*Continued on page 51*

## Apollo yields patent bid to lord of the Token-Ring

BY PATRICIA KEEFE  
CW STAFF

CHELMSFORD, Mass. — With a push from parent Hewlett-Packard Co., Apollo Computer knuckled under earlier this month to Olof Soderblom's demands that it license patented Token-Ring technology.

Soderblom is the holder of multiple Token-Ring patents and a vice-chairman of Netherlands-based Willemijn Holding B.V., which oversees licensing of his patents.

The withdrawal of Apollo's

challenge to Soderblom's patents leaves Token-Ring supplier Madge Networks Ltd. in Bucks, England, as the lone resister. It also has the potential to scuttle the agenda of the Open Token Foundation's (OTF) Intellectual Property Rights subcommittee, which was created to look into the legality of the Soderblom patents.

"We were all hoping Apollo would do our dirty work for us," conceded OTF co-founder Robert Metcalfe, who also co-founded 3Com Corp.

A spokeswoman for Madge

Token-Ring adapters.

Unlike Token-Ring, Ethernet is in the public domain at the insistence of the IEEE 802 committee, Metcalfe said. Furthermore, "when Xerox came up with a one-time, \$1,000 licensing fee, the committee complained bitterly that it wasn't nominal enough," he claimed. "But when IBM came in [with Token-Ring], the IEEE showed a

*Continued on page 51*

### Inside

- OSF requests technology specifications for key Unix tools. Page 50.
- Progressive Insurance carves \$3.6 million slice off telecom bill by consolidating systems. Page 50.

## DEC sweeps up factory floor profits

BY ELISABETH HORWITT  
CW STAFF

CAMBRIDGE, Mass. — Digital Equipment Corp.'s Decnet retained the lion's share of the factory-floor networking market last year, while users awaited general availability of Manufacturing Automation Protocol (MAP) Version 3.0 products, according to a recent study by Advanced Manufacturing Research, Inc. (AMR).

Last year, MAP vendors installed approximately 700 nodes, or less than \$10 million in end-user business, estimated the research firm, which is based here. The market has continued

to be slow this year, with MAP 3.0 products available from only a handful of vendors, AMR said. Overall, there are now approximately 25 MAP production networks and about 250 pilots.

MAP must gain market share at the expense of two major entrenched rivals: Decnet and personal computer networks, according to AMR.

Decnet sales exceeded \$100 million in 1988, approximately 46% of the total market. AMR forecast continued growth, or 20%, for Decnet in 1989 with \$125 million. Out of 150 Fortune 500 manufacturing companies surveyed by the research firm, 50% had Decnet on the

shop floor in 1988. Forty-three percent had standardized on DEC's VAX/VMS as their primary platform in the plant.

Close behind Decnet in plant networking popularity was Transmission Control Protocol/Internet Protocol (TCP/IP), AMR said. Last year's Enterprise Networking Event and the activities of the MAP/TOP Users Group have actually increased TCP/IP's popularity by demonstrating the need for a network architecture as well as the incompleteness of Open Systems Interconnect (OSI), the research firm found.

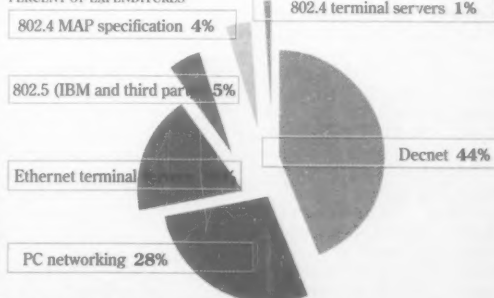
AMR predicted that TCP/IP

*Continued on page 55*

### Shop talk

Decnet reaps greatest end-user dollars among plant floor LANs, but PC networks are growing in popularity

PERCENT OF EXPENDITURES\*



\*Includes both hardware and software communications products

SOURCE: ADVANCED MANUFACTURING RESEARCH

CW CHART: TOM MONAHAN

# OSF calls for Unix net specs

BY ELISABETH HORWITT  
CW STAFF

CAMBRIDGE, Mass. — The Open Software Foundation (OSF) released its third request for technology (RFT), asking vendors to submit specifications for a Unix-based distributed computing environment.

This most recent request is for a core set of tools that will enable users to distribute applications across a multivendor network, OSF indicated. The services could include, but are not limited to, the following:

- Remote procedure call (RPC) services, which would define how an application on one system would communicate with a program on another system.
- Naming services, for designating resources across the network.
- Authentication services for providing network security.
- Presentation services, to accommodate different vendors' data representations.
- Distributed file systems, to provide file access across a multivendor network.

**T**HIS REQUEST is for a core set of tools to enable users to distribute applications across a multivendor network.

Hewlett-Packard Co.'s Apollo division and Digital Equipment Corp. have already announced their intentions to make a submission in the RPC category. Their submission will be an extended version of the RPC, which Apollo developed for its Network Computing System.

The DEC-Apollo effort could add robustness to the OSF Unix platform, said Peter Schay, a program director at Stamford, Conn., market research firm Gartner Group, Inc. "Our belief is that DEC will offer whatever the OSF decides on" as the basis for distributed Ultrix systems. For VMS, DEC will likely implement whatever it develops with Apollo, even if OSF picks something different, Schay added.

A letter of intent to respond to the RFT is due July 28, OSF announced. Completed submissions are due Oct. 6. Implementations must conform to standards that have already been accepted by OSF, including the IEEE 1003.1 Posix system interface specification.

# Insurer consolidates telecom to save

BY ELLIS BOOKER  
CW STAFF

CLEVELAND — Progressive Casualty Insurance Co.'s recent move to consolidate three separate telecommunications systems into one is expected to save the firm \$3.6 million.

The costs for the insurance company's telecommunications service totaled about \$10 million last year.

Late last month, Progressive awarded a three-year, \$27 million contract to provide voice and data services to its 189 U.S. locations to MCI Communica-

tions Corp., which beat out AT&T and U.S. Sprint Communications Co.

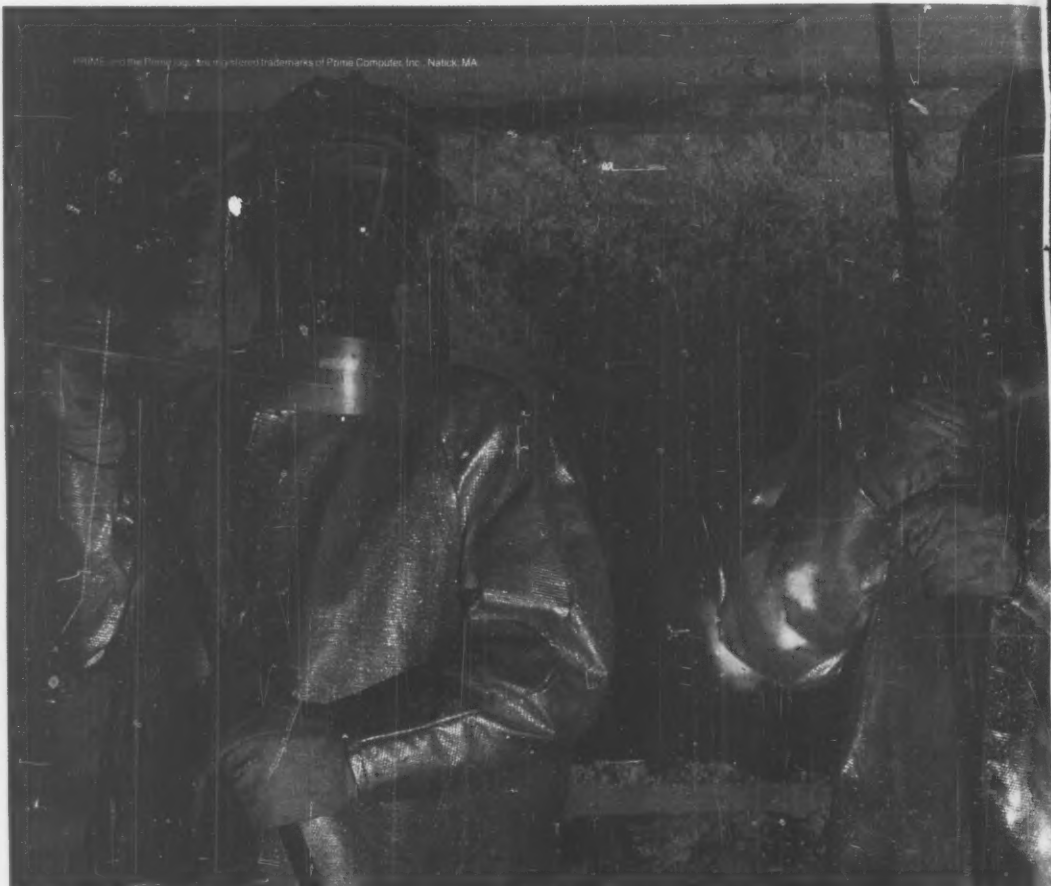
## Nonprofit payoff

MCI was able to offer Progressive a discount because the insurer is a participant of the Insurance Value Added Network

Services, a nonprofit consortium for independent insurance organizations that negotiated a volume discount deal with MCI in 1987.

MCI will provide toll-free service and its Vnet service — the firm's virtual private network — for voice communications between Progressive's offices.

Progressive's new private data network, called the Pro-



# WE HELP A HEAVY STICK TO THEIR

Every day, the primary division of Alumax Inc. ships over four million pounds of aluminum worldwide. Ingots. Slabs. Billets.

Now that's heavy metal.

And how does America's third largest aluminum producer meet its demanding schedules? With computer systems from Prime.



We gave Alumax the capacity to reorganize and track primary production. Coordinate shipping and invoicing. Control volume. Monitor inventory. So the right materials show up when and where they're supposed to. Now Alumax performs with less inventory and saves money because things run smoother.



gressive Automated Claims Management network, will provide the facilities for this network.

Progressive is still evaluating a carrier for its fractional T1 needs. The firm will retain Williams Telecommunications Group, Inc. in Tulsa, Okla., as the provider of a T1 backbone network that links five of its network nodes.

## Apollo

FROM PAGE 49

lack of strength by turning their cheek."

The issue of licensed vs. public-domain technology could come to a head if the European community makes International Standards Organization (ISO) standards a prerequisite for pur-

chase, according to Metcalfe.

The ISO accepted Ethernet as one of its standards in February after first checking to confirm that the technology was indeed in the public domain. "I wonder what they'll do when the time comes to make Token-Ring an international standard," Metcalfe said.

Swift noted that Soderblom is also pressing patents for 100M

bit/sec. Fiber Distributed Data Interface products, which are based on a token-passing scheme.

"I think the OTF is a good idea, but they are diluting their purpose by [this kind of] extraneous activity," Soderblom said.

HP's decision to sign a nonexclusive license agreement with Willemijn forced Apollo to drop its countersuit to Soderblom's

action filed in February 1988 and agree to pay damages covering its previously unlicensed use of Soderblom's patented technology. Apollo, which had strongly rejected Soderblom's claims, had no comment.

The specific terms of the agreement were not disclosed, except to say that HP may use the patents under Willemijn's "standard terms" and that the settlement included payment of a "substantial sum to Willemijn satisfying all its claims against Apollo."

An HP spokesman declined to comment on why his company decided to settle the suit. He would say only that Apollo's payment to Willemijn was deemed an insubstantial amount by HP and will not affect earnings.

Soderblom now has 40 licensees and said he is negotiating with Apple Computer, Inc., which recently unveiled Token-Ring technology co-developed with Hughes LAN Systems, formerly Sytek, Inc.

## Rockwell

FROM PAGE 49

handle speeds much higher than 9.6K bit/sec., Covey said.

Rockwell is unlikely to replace its LANs with ISDN links, said Jack Tilbury, manager of telecommunications operations at Rockwell. One reason is cost: Even though RS-232-based ISDN terminal board prices have plummeted from \$1,100 to \$325 in the last year, they still cost more than Ethernet boards, Tilbury said.

Rockwell is evaluating ISDN



Rockwell's Covey

terminal emulation boards that "plug any telephone into a CRT," eliminating the need for expensive ISDN telephone sets, Tilbury said.

Electronic mail is another potential ISDN application that Rockwell sees no current need for because the company "already has a number of packages integrated with the mainframe," Tilbury said.

One major reason for limited ISDN use in the division is the fact that it is a 30-year-old entity "with a number of communication infrastructures already in place," Tilbury said. Meanwhile, corporate Rockwell is evaluating ISDN for other divisions, Tilbury said.



# METAL GROUP SCHEDULE.

We also let headquarters in California share information with plants in South Carolina, Maryland, and Washington. And we keep everyone up-to-date with a flexible financial reporting system.

In 1987, Alumax made a big dent in the market with sales of more than \$2.2 billion. That success is part of our success. Prime is a Fortune 500 company with annual revenues of over \$1.5 billion.

If you'd like to know how Prime can help you get

your act together, call 1-800-343-2540 (In Canada, 1-800-268-4700).

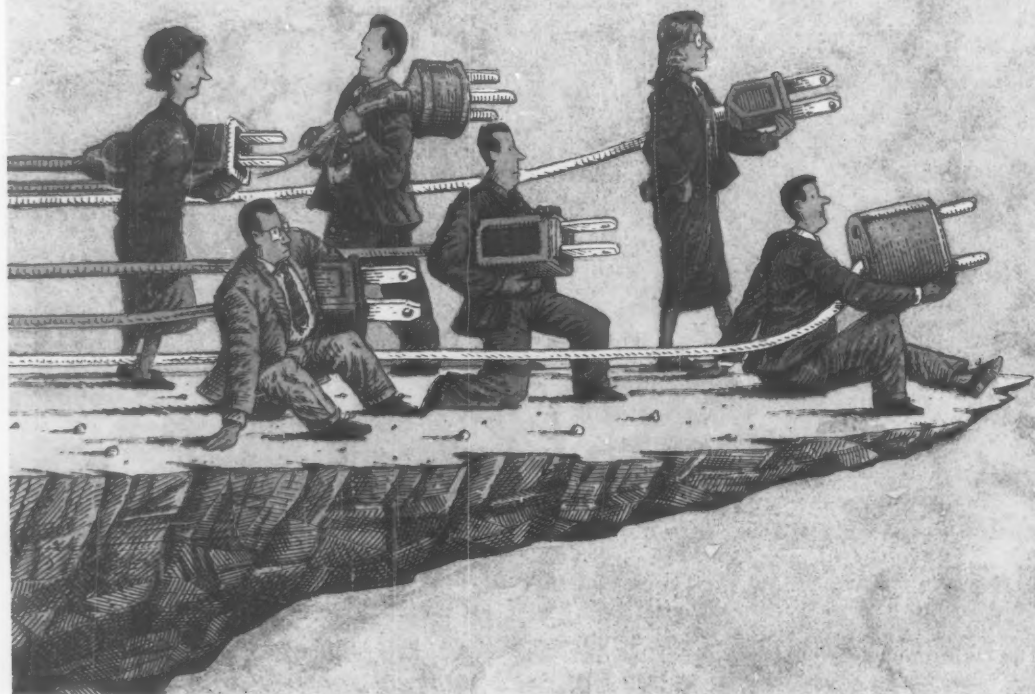
Prime. Because performance is everything.

**Prime**

Prime Computer, Inc.

Prime and the Johnson & Johnson Family of Companies are proud co-sponsors of the PBS series NOVA.

"How can we expect  
our people to connect if  
our computers can't?"





Your sales staff doesn't know what's going on in marketing. Purchasing and accounting can't agree on the numbers. And production isn't communicating with R&D.

Hewlett-Packard has a better way.

A truly open computer networking strategy. A strategy that acknowledges the fact that the real world is a multivendor world.

A strategy that, unlike those of other companies, is uniquely dedicated to standards which make that real world work.

We call it HP AdvanceNet.

It's a strategy that protects your investment. That increases productivity by insuring that everyone in your organization has access to the information they need when they need it. And that conforms to standards which offer your company far greater potential for communication and growth into the future.

If you believe your company works better when people, and computers, work together, pass this number on to your information systems manager: **1-800-752-0900, Ext. 282G.** We'll send the complete AdvanceNet story.

**There is a better way.**



**HEWLETT  
PACKARD**



NEW DEALS

# Shell hires MCI to link facilities

Shell Oil Co. has selected MCI Communications Corp. to provide and operate a nationwide high-capacity communications network linking Shell's Houston locations with its principal business centers.

MCI will supply a T1 network routed via two geographically different paths to connect Shell's operating locations to its primary computing facility in Houston.

The dual configuration will provide redundancy to protect against a common point of failure.

Exxon Corp. installed Timeplex, Inc.'s Link/2 Integrated Connectivity System to provide T1 connections between its corporate office and the Valdez, Alaska, site administering recovery operations for the Prince William Sound oil spill.

Specialty Hospital Group (SHG) of National Medical Enterprises has tapped Digital Equipment Corp. to tie 74 U.S. psychiatric hospitals to its Washington, D.C., headquarters.

The multiyear, multi-site contract calls for a DEC VAX system and peripherals to be installed at each site. Software will support integrated operations and enable SHG to consolidate financial information from all the hospitals.

Citibank Canada of Toronto recently implemented a 400-node, seven-server network using Banyan Systems, Inc.'s Virtual Networking Software/386 package. That decision was based on a study conducted by Citibank NA in New York.

The Toronto office is replacing its Datapoint Corp. Arcnet system with the Vines network, because it has a more open architecture, the bank said. Vines was also chosen for its security and resource-sharing capabilities. Workstations on the network do not have hard disks because of audit concerns.

## Fritz

FROM PAGE 49

where III by Dynamic Microprocessor Associates are well suited for ISDN screen-sharing. Neither was designed with ISDN in mind, but both can support a connection over a PC serial port to an ISDN B channel.

When remote access soft-

ware is used with a 2,400 bit/sec. modem, the delay for a screen transfer is significant.

However, when teamed with an ISDN B channel operating at 38.4K bit/sec., it really begins to fly. Color screens are transferred in less than a second, and cursor movement is very fast.

Besides speed, the system is said to provide more sophisticated

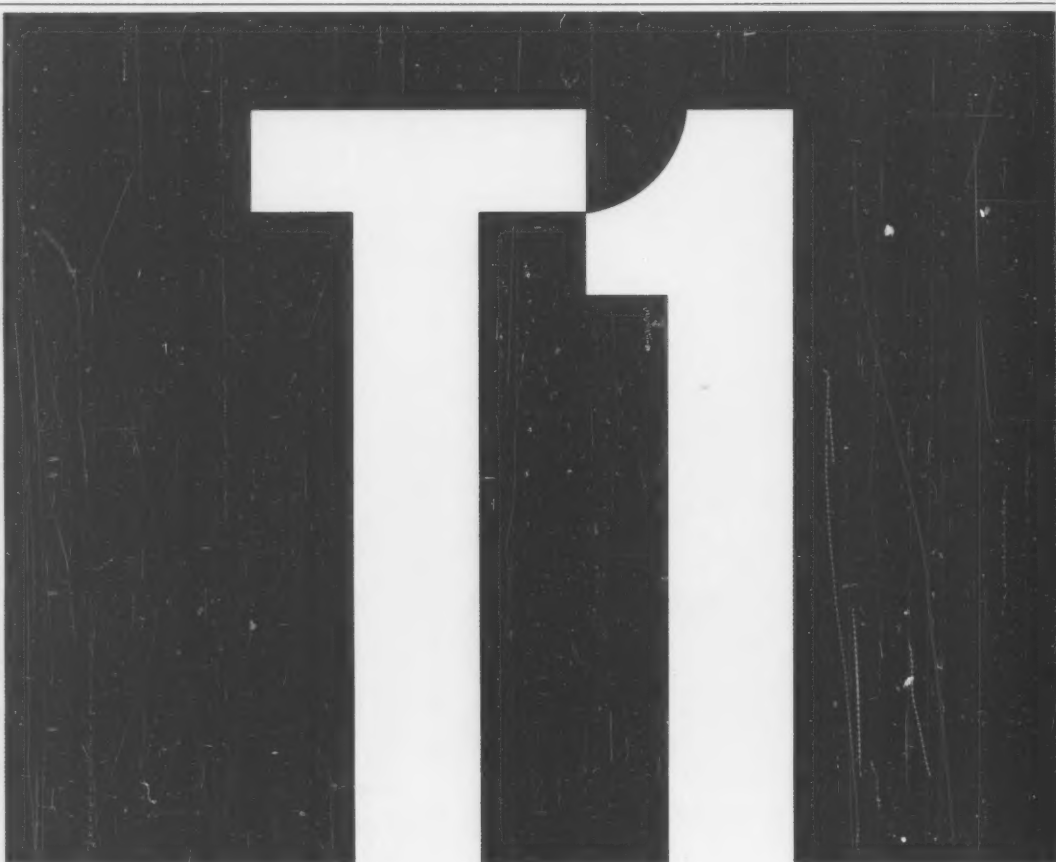
screen-sharing than the PC applications described above.

A light pen is used to draw over the application's screen, much like placing a transparency over the computer's screen. This allows either user to highlight information or just doodle on the screen and have it be visible on both machines.

Timbuctu/Remote, a software package from Farallon

Computing, is said to provide similar capabilities for the Macintosh.

Of what use is screen-sharing to the average business user? Well, it can be a big help to anyone generating a request for proposals or a response to an RFP. Different departments working on different sections can work together and compare results by sharing screens.



## The networking T1 from the #1 name in network solutions.

Meet Omnimax® 8000. The newest addition to the most complete T1 product line in the industry...a range of solutions that covers everything from channel banks and DACS to the most sophisticated, multi-nodal, networking T1 muxes.

Built with over 30 years of networking knowledge, the mid-range 8000 puts our experience to work for you. To make T1 more like you'd like it to be. More affordable. More reliable. More manageable.



More affordable, because **modular architecture** lets you buy only the features you need. The result: a customized T1 solution just right for your network. And for your budget.

More reliable, because **redundant integral CSUs** — both primary and hot back-up spare for every T1 line — ensure maximum uptime. You don't waste time and money replacing CSUs. You won't lose your diagnostic database either. And you can tell the difference between T1 line and CSU problems faster and easier, too.

More manageable, because instead of the risk of a single point of failure, you get **single point control** of both CSUs and T1 muxes. One menu-driven, integral network management system gives you comprehensive tools to ensure maximum network availability.

Want more? How about bandwidth contention. Bypass, automatic alternate routing, and drop/insert. Versatile data and voice support. And still more. All at a price you're sure to like.



Such interaction is useful to any group preparing any type of presentation. I had a meeting this morning with a department chairman, for example, who needs to generate student documents in tandem with one of his assistants.

The nice thing about screen-sharing vs. straight file transfer is that you can see the changes as they occur rather than sug-

gesting something and sending it, having someone look at it, comment and send it back.

What ISDN brings to the table is quicker response time and the ability to talk over the phone during the process. When ISDN services finally become ubiquitous, you can set up screen-sharing conferences in the same building, city or across the country.

ISDN screen-sharing does have its drawbacks. The operation of the remote PC is so snappy that it is sometimes easy to forget which machine you are actually using.

After receiving an important file from a company in Detroit, for example, I set up my computer to be a remote terminal for a screen-sharing demonstration. After the demo was com-

pleted, I sat down at the PC to begin work on the file.

With a start, I noticed that the file was missing. I feared it had somehow been erased. Then I noticed that my hard-drive light did not come on in response to the DOS directory command.

It finally dawned on me that the hard disk I was so frantically scanning was not mine, but the

remote machine's. I hastily tore down the session, checked my hard disk, and lo and behold! there was the precious file.

ISDN screen-sharing can be so efficient that it's sometimes hard to tell exactly which PC you're operating from.

Fritz is a data communications analyst at West Virginia University in Morgantown.

## DEC

FROM PAGE 49

will continue to be viable until the early to mid-1990s, when the Government OSI Profile standard will push agencies, contractors and their vendors to migrate to the OSI standard.

PC connectivity is currently the fastest growing area of factory networking. AMR estimated that more than 70% of existing MAP installations are PC connections.

AMR found that leading non-MAP PC local-area network vendors such as IBM, Novell, Inc. and 3Com Corp. already have second place in the factory networking market with \$60 million in revenues in 1988. The research firm predicted that PC LANs will have 28% of the 1989 factory LAN market, with 33% revenue growth.

Pushing this trend, AMR said, is the increasing number of PCs on the plant floor. The firm estimated that close to one million PCs and clones will be used within manufacturing plants by year's end.

Another potential MAP rival is the 802.5 Token-Ring protocol, whose popularity on the plant floor should increase as a result of IBM's recent announcement of a 16M bit/sec. version, AMR said. Novell and Ungermann-Bass, Inc. have also introduced 16M bit/sec. Token-Ring offerings.

### Further on the MAP

According to AMR, MAP will make some progress this year in the following areas:

- In the U.S., General Motors Corp. is clearly the leader and is increasing its investment in MAP implementation. The Saturn plant will be a major MAP installation, composed of more than 100 nodes, and other GM plants will follow.
- Support is coming from several European sites — predominantly automobile and aerospace users.
- Japanese vendors strongly support MAP. Yokogawa Hokushin Electric Corp., Omron Tateisi Electronics Co. and Fanuc Ltd. clearly see MAP as part of their worldwide product strategies.

The above support will yield eight to 12 major MAP projects this year, accounting for approximately 1,200 end-user nodes in 1989, AMR said.

## We stand on our record, but never rest on our laurels.

We're working to add leadership in T1 to our history of achievement. And if our track record is any guide, we're the networking company you can count on for quality, reliability, and stability.

Our full T1 line is just part of a comprehensive range of network components that encompasses modems, DSUs, fiberoptic products, statistical multiplexers, data encryption products, X.25 systems, and network management systems.

What's more, we go far beyond hardware and software to provide total customer support in 82 countries...before, during, and after the sale. We can help you plan, design, implement, manage, and maintain any size network, anywhere in the world.

© 1989 Rascal-Milgo

You don't have to take our word for it. For example, Datapro\* said, "...a full-service systems supplier...solid products that perform as promised." And IDC\*\* found Rascal-Milgo holds the largest share of both domestic and international markets for network management systems. You can expect the same commitment and long-term performance from Omnimux 8000.

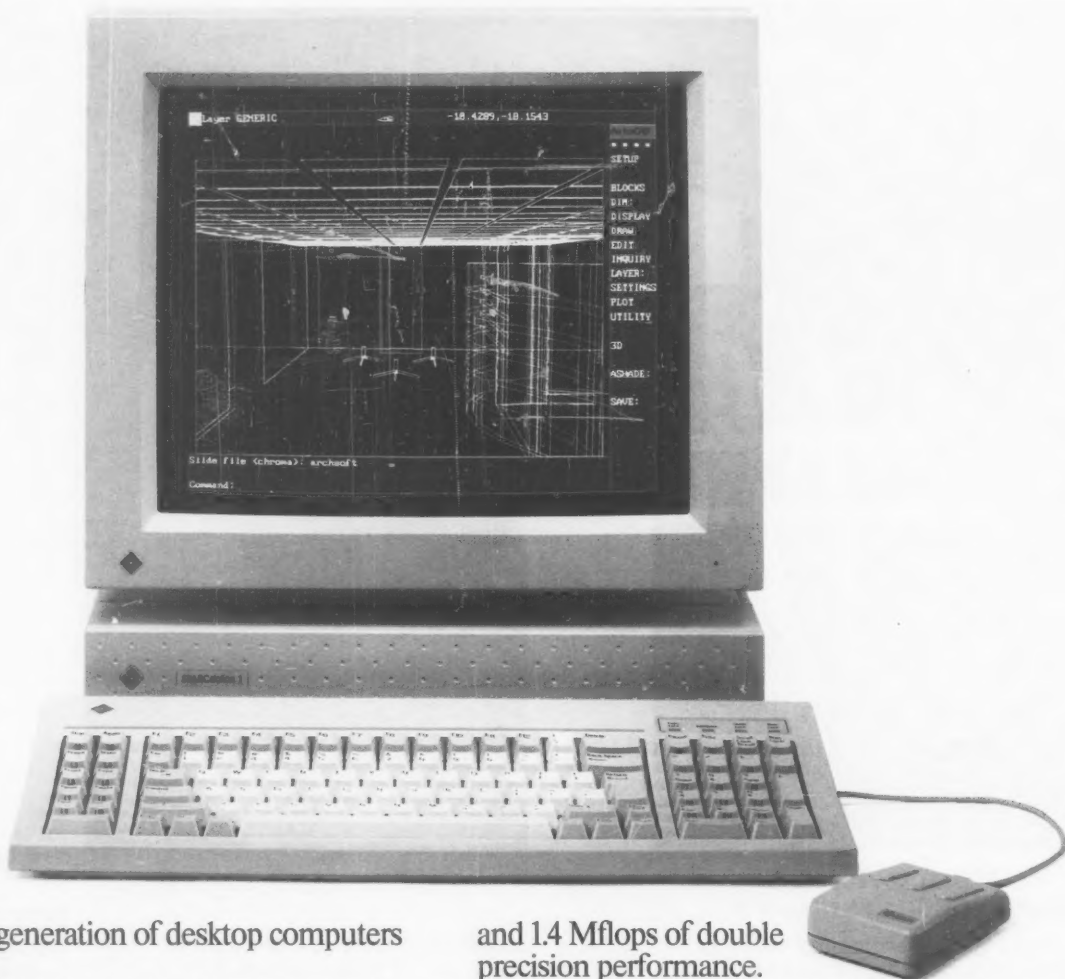
For more information, call toll-free 1-800-327-4440 (in Florida, 1-305-476-4811). Federal Government users, 1-800-327-7909 (in Florida, 1-305-476-4452).

Omnimux 8000. Now, that's more like it. But then, that's Rascal-Milgo. Reaching beyond today's standards.

\*Datapro, *User Ratings of Network Management Systems*, September, 1988.  
\*\*International Data Corporation (IDC), *Quantitative Analysis of the Network Management Market*, October, 1988.

**Rascal-Milgo®**  
RACAL

# SPARCSTATION 1. POWERFUL DESKTOP



The next generation of desktop computers is here today.

The SPARCstation 1™ from Sun Microsystems™

A miracle of RISC miniaturization, integration and innovation, the SPARCstation 1 sets a new benchmark of price, performance and functionality by which all others must be judged.

Simply put: for less than \$9,000\*, the SPARCstation 1 gives you more power integrated with more features than any other desktop computer in the world. Making it the world's most powerful desktop.

The SPARCstation 1 is smaller than an IBM PC yet it gives you 12.5 Dhrystone MIPS

and 1.4 Mflops of double precision performance.

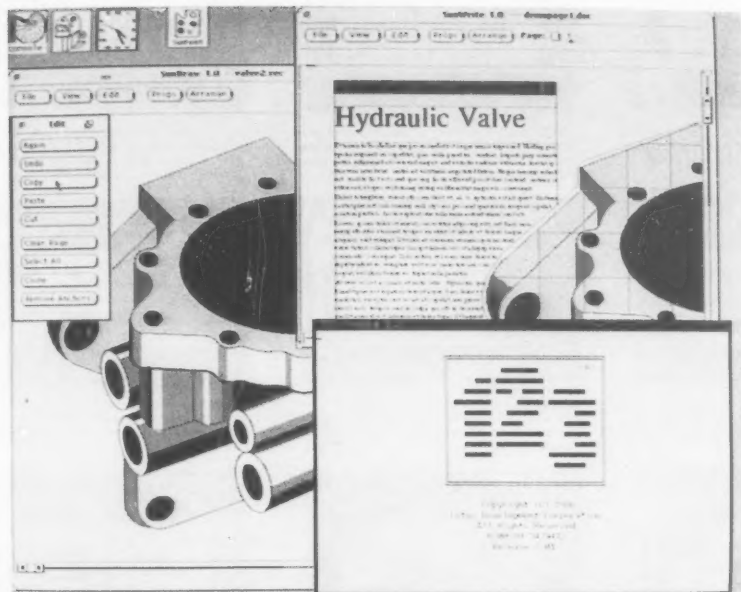
That translates into three times the power of the most fully loaded and hotly accelerated PC or traditional workstation.



*The SPARCstation 1. It may look small but when you compare its power and features to anything else on the market, it's clearly the world's most powerful desktop.*

\*The US list price for one SPARCstation 1 with a 17-inch monochrome (grayscale) display and eight megabytes of main memory. Possibly the best desktop computer deal in history. Of course, SPARCstations are available in a variety of configurations to satisfy the needs of different users.

# THE WORLD'S MOST FOR THE PRICE OF A PC.



OPEN LOOK™ gives you all the power of UNIX® with an interface that's as easy-to-use as the easiest-to-use personal computer. Point at an icon, click the mouse button and your SPARCstation 1 goes to work at blinding speeds. Shown here SunWrite, SunPaint and SunDraw working with Lotus 1-2-3.

And with our high-performance GX Series, the performance curve goes right off the chart.

A major technological breakthrough in computer graphics, our SPARCstation 1 GX produces up to 400,000 vectors a second. Giving you two times the graphic performance of any machine twice its price.

And it doesn't just speed up 2D and 3D wire frame applications, it speeds up the overall performance of your system. Including windowing and scrolling through text.

And the list of firsts goes on and on.

The SPARCstation 1 has a new very high speed bus that delivers many times the performance of a Micro-Channel architecture.

Which makes it very easy for your SPARCstation 1 to expand, connect and communicate with other devices.

From Laser Printers to Ethernet gateways.

The SPARCstation 1 comes packed with a full eight megabytes of RAM. Expandable up to 16 megabytes. With your choice of a high resolution monochrome/grayscale or color display.

It integrates up to 208 megabytes of hard disk storage. A 3.5 inch IBM compatible floppy disk drive. Built-in 32-bit Ethernet. A blindingly fast SCSI connection. Expansion boxes for up to a gigabyte of additional disk or tape storage.

And it's all enclosed in a 16 inch square box that consumes less energy than a 100 watt light bulb.

If you still need more, there is.

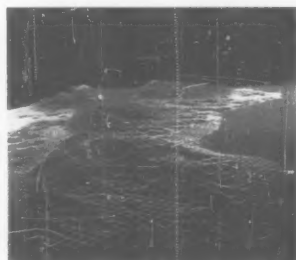
The SPARCstation 1 is the ideal machine for voice mail and multimedia applications. It has its own built-in speaker and microphone jack to record

and playback music, voice or any other sound you like to hear.

What's more, the SPARCstation 1 is a member of a whole family of SPARCstations and high-capacity SPARCservers™.

To hear all the details on the world's most powerful desktop and the other members of the SPARC family, call 1-800-223-6736. Or in California, 1-800-322-6736.

And get ready to set off a few sparks of your own.



For 3D applications, the SPARCstation 1 GX lets you interactively manipulate 3D objects at speeds that make ordinary workstations seem downright sluggish.



Systems for Open Computing™



# INTRODUCING SPARCWARE. THE BEST TAPE COLLECTION IN HISTORY.



With powerful graphics, database management, and consolidation facilities, 20/20 is the only spreadsheet optimized for the Sun workstation, offering mouse support, dynamic windowing and pop-up menus.



Auto-trol Technology, Supplier and Integrator DBMS-CAD-CAM-EPS.



CADRE provides software tools and integrated systems to manage and automate the design, code generation, and test of high-performance systems and software worldwide.



CATS Software has systems in operation on over seventy trading floors in twelve cities globally. A market leader in the development of financial software for fixed income derivative instruments.



Formed by the merger of Daisy and Cadnetix, DAZIX provides the richest set of CAE/CAD/CAM tools in the EDA industry. DAZIX EDA tools also support the industry's most widely accepted standards.



HNB develops, markets and supports design analysis systems used by electronics engineers. The company's products automate the design and test of integrated circuits, printed circuit boards and systems.



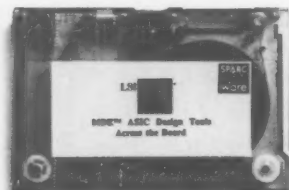
Statestate is the premier graphic computer-aided systems engineering tool for modeling, simulating and prototyping complex systems during specification. Users are leading Fortune 500 companies.



IMSL mathematical and statistical FORTRAN subroutine libraries reduce development time while increasing the accuracy and robustness of FORTRAN applications. IMSL makes FORTRAN more useful.



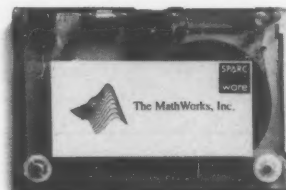
ART, the Automated Reasoning Tool from Inference. Proven and powerful software technology for building and delivering expert systems that solve business problems.



Over 6,000 ASICs have been designed using LSI Logic's MDE tools with a Right-First-Time record. MDE tools can design ICs with up to 200K gates on a chip and entire systems of over two million gates.



The MacNeal-Schwendler Corporation has been serving the engineering community for over 25 years. Today, MSC/NASTRAN is the most widely-used engineering analysis program in the world.



MATLAB™ software provides the high-productivity and high-creativity environment for interactive numerical analysis and graphical display in scientific and engineering applications.



ANVIL-5000™ 3-D CADD/CAM software for mechanical engineering integrates wireframe, surface and solids modeling, drafting, finite-element mesh, and NC machining into a single database.



Major corporations worldwide are building knowledge-based systems with NEXPERT in finance, MIS/DP, manufacturing, and other industries. NEXPERT brings embedded intelligence to mainstream applications.



ParcPlace Systems is dedicated to improving the productivity of software development and maintenance in commercial organizations providing Smalltalk-80 and C++ object-oriented programming systems.



PHOENICS is the leading general-purpose software system for simulation of fluid flow, heat transfer, combustion and chemical reaction processes in mechanical, environmental or biomedical studies.



Saber-C is the complete C language programming environment. It improves programmer productivity and software quality during the implementation, testing and maintenance phases of software development.



SL-GMS—object-oriented system creates visual interfaces and precision screens for control, display and analysis of real-time, real-world processes and simulated visualizations without programming.



Thousands of C application developers worldwide use Objective-C™ to deliver the benefits of object-oriented technology in telecommunications, manufacturing, system software, financial services... and more!



SYBASE, the leading high performance relational database management system for on-line applications, features an advanced Client/Server Architecture with Window-Based, 4GL Development tools.



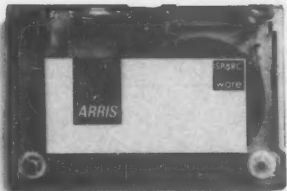
TeleGen™, TeleSoft's Ada compilation system, offers a full-featured set of integrated tools for developing efficient, reliable ADA applications on all Sun platforms.

This is just a small sampling of the more than 500 SPARCware™ solutions available today. Which means you can immediately unleash the full power of the new Sun SPARCstation™ 1. If you would like to see more detailed information on any of these products





The Inspire™ erasable optical storage system lets you store 594 Mbytes on an ISO-standard, 5 1/4" removable cartridge. Rewritable and reliable, Inspire looks like any other disk drive to your Sun.



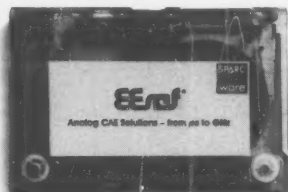
Sigma Design's ARRIS software offers architects and facility managers extensive 2D and 3D capabilities with UNIX flexibility. ARRIS is available through a world-wide distribution network.



Supercomputing for graphics and image processing. Parallel processing solutions for real-time scientific visualization, 3D simulation, medical imaging, image analysis and photorealistic rendering.



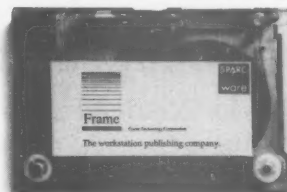
Autodesk is the world's leading supplier of computer-aided design and engineering (CAD/CAE) software for personal computers and workstations.



EESof software simulates difficult high-frequency analog problems, like circuit board spurious coupling at 50 to 500 MHz clock rates, sub-nS driver rise-time, and GHz amplifier nonlinearity.



Eiffel, the most advanced object-oriented language and environment available, adds the full power of O.O. programming to modern software engineering principles. By Interactive Software Engineering.



FrameMaker® 2.0. Powerful, accessible publishing software that combines full-featured word processing, graphics, page layout and book-building tools for creating publication quality documents.



Harris Scientific Calculations produces the SCICARDS® System for printed circuit board design. SCICARDS features 100% routing and many interfaces to companion tools for the total PCB design solution.



Informix Software Inc. develops and markets high-performance relational database management and office automation software for manufacturing, financial services, scientific and related industries.



INGRES combines superior application development and information management products that meet the challenges of performance and accessibility important to today's organizations.



Software through Pictures™ delivers the promise of CASE by being the only integrated, multi-user CASE environment for all Sun architectures (Sun-3, Sun386i and SPARC machines).



InterCAP Graphics Systems provides automated graphics software—Illustrator II™—for dedicated illustration; thus automating the process of creating, modifying and managing technical illustrations.



Image-Pro™ World's leading image processing software for image analysis, enhancement and interpretation. Available as easy-to-use application or powerful sub-routine library from Media Cybernetics.



Mercury's RISC-based 32 & 64-bit floating-point attached processors deliver up to 10 times application performance gains, and feature C & Fortran compilers, vector preprocessor and math libraries.



PSpice, MicroSim's electronic circuit simulator helps engineers analyze and refine designs. With over 8,000 installations, more EEs use PSpice than all other commercial SPICE-simulators combined.



Quickly and easily input photos, drawings and logos to electronic publishing documents with Microtek's ScanIt™ or ScanVu™ 400 grayscale scanning system. Compatible with all Sun platforms!



More than a million professionals throughout the world have made the SAS System the #1 choice for efficient data management, reliable data analysis, and effective reporting and graphic presentation.



SDRC is a leading international supplier of mechanical computer-aided engineering (MCAE) software and engineering services used by automotive, aerospace and industrial manufacturers.



Shinko printers make color prints & overheads easy to obtain. Shinkotool network software and 300 DPI A & B size printers and new 400 DPI scanner are available by Mitsubishi Int'l Corp.



For integrated circuit design, SCS offers a broad line of high-performance software tools. Leading semiconductor, aerospace and computer companies have chosen SCS for their state-of-the-art ICs.



Q-Calc and Q-Calc RealTime spreadsheets. EMACS, CMACS, ADAMACS programmers' text editors. X-Desktop environment. Masterplan project management. BoKs computer system security.



DataViews. Software tools for graphical user interface development and dynamic display of critical information in applications including C3I, process control, network monitoring, medical and financial services.



Viewlogic's Workview is the "open" CAE system that specializes in integrating into existing environments. A Workview/SPARCstation 1 combination delivers the best CAE tools on the best desktop workstation.

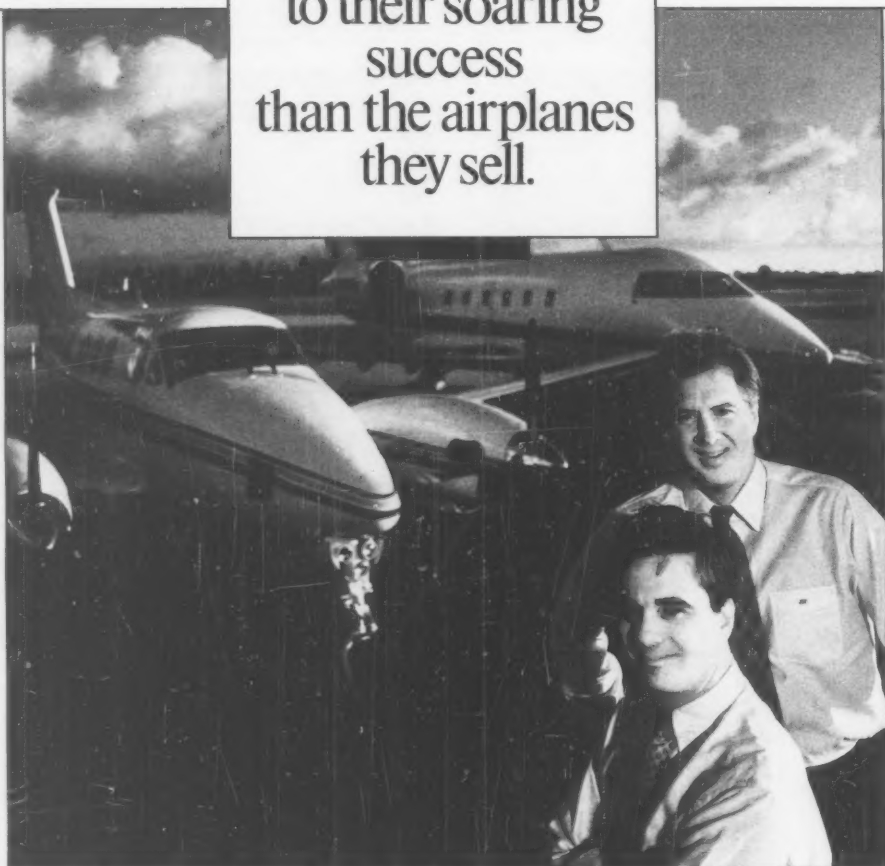


The world's most popular word processor is now available for Sun systems. WordPerfect 4.2 provides dozens of high-end features for a variety of word processing applications.

or if you would like to see the over 450 other SPARCware solutions that wouldn't fit in this ad, call 1-800-227-1817, ext. 25. And start your collection of the most powerful desktop solutions on tape.

 **SUN**  
microsystems  
Systems for Open Computing™

There's more  
to their soaring  
success  
than the airplanes  
they sell.



Scott Phillips and  
Don Lewandowski,  
partners,  
Maxfly Aviation, Inc.

Industry experts shook their heads when youthful pilots Scott Phillips and Don Lewandowski set out to break into the tight-knit world of corporate aircraft sales five years ago. The marketing of private airplanes was a business dominated by big players with big capital—and an average of 30 years' experience.

But ComputerLand® was able to give Don and Scott an edge the big boys didn't have. A unique database system run on IBM® PS/2® computers. With it, Maxfly Aviation can track every plane ever made in the categories they sell—right down to the number of hours it has flown and the avionics on board. And a Maxfly salesperson can pull that information up at a moment's notice

***"ComputerLand  
wasn't just selling  
us; they were with  
us for the long haul."***

Scott Phillips, President, Maxfly Aviation.



The IBM Personal System/2® family.

when discussing options with a prospective buyer.

ComputerLand Account Representative Don Bibb chose IBM computers for the Maxfly system because "continuity and reliability were key for them. With IBM computers, they got state-of-the-art quality, and a company that would be able to keep up with their growth."

With the help of their one-of-a-kind computer system, Maxfly Aviation's sales have nearly tripled over the last three years, and it's been ranked among the 100 fastest-growing companies in southwest Florida.\* What's next for these high-fliers? International sales, says Scott. Bigger jets and commercial planes, says Don. Whatever course they set, the sky certainly won't be the limit.

**ComputerLand®**  
Business to business. Person to person.



# MANAGER'S JOURNAL

## EXECUTIVE TRACK



**Diane Forrest**, director of MIS at Tambrands, Inc., was recently promoted to vice-president of information systems. Forrest has been employed at Tambrands in Lake Success, N.Y., since 1987.

Prior to her career at Tambrands, Forrest held positions at Peat Marwick Main & Co., Nabisco Brands, Inc. and Thomas J. Lipton, Inc. She is a graduate of Boston University and holds an MBA from Pace University.

Tambrands is a Fortune 500 international manufacturer and marketer of personal care products.

**Bill Barnett** was recently appointed executive director of IS at Fluor Daniel, Inc., the principal subsidiary of Fluor Corp.

Barnett, 47, is responsible for overseeing all IS technologies, including computing and telecommunications, for the Irvine, Calif.-based company's domestic operations.

Barnett began his career at Fluor in 1980 as director of automation engineering in the Greenville, S.C., office.

Prior to joining the company, Barnett taught computer engineering for three years at Clemson University. He has also held positions as a technical staff member at Bell Laboratories and as a process-control engineer at Du Pont Co.

Barnett received bachelor's and doctorate degrees in electrical engineering from Clemson University and holds a master's in electrical engineering from Rutgers University.

### Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor-Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

## Economies of time and money

*The best things in life aren't always free, but they can be obtained at a small price*

BY ALAN J. RYAN  
CW STAFF

Sometimes the simplest ideas prove to be the most useful.

- At Blue Cross/Blue Shield of Connecticut, a rarely used facsimile machine has in six months become the lifeline of the company's sales force.

- At Trump Plaza Hotel and Casino in Atlantic City, a coupon program has been automated, allowing for faster moving lines at the casino cashiers.

- In one department at Du Pont Co., the use of MCI Communications Corp.'s MCI Mail instead of overnight mail services has helped accelerate contract turnaround.

The best part? These simple ideas are not accompanied by high price tags. They are examples of how information systems groups can put simple ideas into practice and realize intangible benefits.

For instance, David Fusco, Blue Cross/Blue Shield's project manager of MIS for the sales and marketing areas, said the only investment needed to create what has become an essential tool for the sales force was the time it took to design a standardized form that could be faxed.

The one-page form allows the company's 30- to 40-member sales force to simply check off items relating to its sales activities for the week. No one on Fusco's end has to decipher myriad handwriting styles because all of the information comes in the same format.

"Before, information might have come in on a napkin from a luncheon the salesman had with a client," Fusco said. Now, the sales representatives fax the information to Fusco's office each Friday; by that afternoon, the data has been compiled into an executive summary sheet that is distributed to all of the salesmen and the manage-



LINDA BLECK

ment committee. With the old system, the reports that came out weekly contained information that was two weeks old, he added.

Additionally, when information is entered into the Blue Cross system, it is also entered into a database of sales and competitive analysis information for the future, Fusco said.

Trump Plaza hires an outside consulting firm to put together databases of potential new customers and sends them promotional coupons, which are redeemable for \$10 in gambling tokens.

But the marketing promotion

proved to be almost too popular — lines were forming with people waiting to cash in their coupons for tokens. Subsequently, the process was automated to ease the problem and at a very modest cost, according to Matthew Meldon, a microcomputer manager.

Previously, before the coupon could be exchanged for chips, someone had to look up the coupon holder's name on a hard-copy list, Meldon said. That process was improved so that a name could be keyed into a microcomputer, cutting the processing time in half.

*Continued on page 57*

## Change coming? You can count on it

BY CLINTON WILDER  
CW STAFF

Forget about "chief information officer." The information systems executive of the 1990s should more appropriately be named "chief change officer," according to Terence V. Neill, managing director of industry programs at Andersen Consulting, Inc.

Managing change is the No. 1 challenge facing the IS profession, Neill said at a recent meeting of the Society for Information Management's Boston chapter. "We must learn to cope with change as a constant," Neill said.

What kind of change? Neill stressed that the top IS executive must be the driving force to change long-held atti-

tudes toward the IS function, both within the IS function and outside of it. "The challenge is, how do you get people to change in order to get the most benefit from the technology?" he said.

While that issue usually applies to educating business managers and end users to integrate technology into corporate strategy, Neill said that IS execs are changing their own thinking on systems development.

"MIS itself is already orienting staff members to new approaches using CASE tools, for example," Neill said.

As a model for how attitudes can be changed, Neill pointed to the phrase

"made in Japan." By their persevering emphasis on quality, Neill said, Japanese firms have transformed the

phrase — formerly implying cheap and unreliable — to its current meaning of well-made and technologically advanced.

Neill suggested that U.S. businesses' attitudes toward technology will inevitably change as younger managers who have grown up with computers from an early age move up through the management ranks. "To them, information technology will be considered part of the furniture," Neill said. "It won't be considered 'technology' anymore."



Andersen's  
Neill




# Foreseea Bull



# KNOW BULL

Copyright © 2004 Information Systems, Inc. 1004





Some people claim you can't see the future—  
but they're not spending \$600 million a year on  
research and development.

We see computers you converse with, compu-  
ters capable of independent thought, computers  
made of organic material.

And we're seeing them more clearly every day.  
We're Bull. A computer company for a business

environment that's faster, harder, and more punish-  
ing every year. An environment in which traditional  
ideas no longer work.

To succeed today, you need a different kind of  
computer company. A new one.

Know Bull.

1-800-543-6699. Phone for a copy of our  
corporate brochure.

---

**Worldwide  
Information  
Systems**

---

**Bull**

## CALENDAR

A look at lessons learned in the high-technology industry in the 1980s and an in-depth analysis of high-tech market opportunities for the 1990s are on the agenda for the "Deals, Dangers, Directions" Dataquest 1989 conference Aug. 22-23.

The conference in Santa Clara, Calif., will also include discussions on assessing market risks, developing high-tech investment strategies and determining critical success factors for the 1990s, as well as Europe 1992. Workshops will examine ways to find deals in high-tech and future opportunities in Japan.

For more information, contact Dataquest's conference department at 1290 Ridder Park Drive, San Jose, Calif., 95131-2398.

## JULY 3-8

**International Symposium on Information Technology Standardization.** Braunschweig, West Germany, July 4-7 — Contact: John L. Berg, Futuretech, 5 W. Fiebel Road B-12, Alexandria, Va. 22305.

## JULY 9-15

**Security and Audit Conference.** St. Louis, July 9-13 — Contact: Cathy Picconka, Computer Associates International, 711 Stewart Ave., Garden City, N.Y. 11530-4787.

**Artificial Neural Networks Seminar.** Santa Clara, Calif., July 10-12 — Contact: Institute in Computer Science, University of California Extension, Santa Cruz, Calif. 95064.

**C Intensive: An Application-Based Seminar for Programmers.** Santa Clara, Calif., July 10-14 — Contact: Institute in Computer Science, University of California Extension, Santa Cruz, Calif. 95064.

**Desktop Presentation Graphics Conference.** Los Angeles, July 11-13 — Contact: Cambridge Marketing, One Forbes Road, Lexington, Mass. 02173.

**OCS Systems Management.** San Francisco, July 12-14 — Contact: The Institute for Information Management, P.O. Box 361556, Milpitas, Calif. 95035.

**Computer Software: Protection and Marketing Seminar.** San Francisco, July 13-14 — Contact: Practising Law Institute, Dept. 8A-105, 810 Seventh Ave., New York, N.Y., 10019.

**International Telecom Ventures: U.S. Successes and the Global Market Outlook Conference.** San Francisco, July 13-14 — Contact: Telecom Publishing Group, Conference Registrar, P.O. Box 1455, Alexandria, Va., 22313-2055.

## JULY 16-22

**Guide 74.** Toronto, July 16-21 — Contact: Guide International, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

**CASE '89.** London, July 17-21 — Contact: Center for the Study of Data Processing, Campus Box 1141, Washington University, One Brookings Drive, St. Louis, Mo. 63130.

**Institute in Computer Science.** Santa Clara, Calif., July 17-19 — Contact: Institute in Computer Science, University of California Extension, Santa Cruz, Calif. 95064.

**Leveraging the Information Technology Investment Workshop.** Newport Beach, Calif., July 17-19 — Contact: The Information Group, P.O. Box Q, Santa Clara, Calif. 95055-3756.

**Managing Organization Change Program.** Boston, July 17-19 — Contact: ODR, Building 16, 2900 Chamblee-Tucker Road, Atlanta, Ga. 30341.

**Technology Transfer Conference.** Los Angeles, July 17-18 — Contact: The Center for Neural Engineering, University of Southern California, Los Angeles, Calif. 90089-0782.

**Electronic Data Interchange Conference.** San Francisco, Calif., July 18-19 — Contact: Input, 1280 Villa St., Mountain View, Calif. 94041.

**Understanding ISDN Conference.** Cambridge, Mass., July 19-21 — Contact: CAP International, 1 Longwater Circle, Norwell, Mass., 02061.

## JULY 23-29

**Information Center Conference and Expo.** Anaheim, Calif., July 23-27 — Contact: Martha Eversley, Conference Registrar, Weingarten Publications, 38 Chauncy St., Boston, Mass. 02111.

**Sun Expo '89 Training Conference and Trade Exposition for Sun Microsystems Users and Resellers.** Santa Clara, Calif., July 23-25 — Contact: Sun Expo '89, 12416 Hymeadow Drive, Austin, Texas 78750.

**Just-in-Time Seminar.** Washington, D.C., July 24-26 — Contact: American Production and Inventory Control Society, 500 W. Annandale Road, Falls Church, Va. 22046-4274.

**Summer Computer Simulation Conference.** Austin, Texas, July 24-27 — Contact: The Society for Computer Simulation International, P.O. Box 17900, San Diego, Calif. 92117-7900.

**Summer Institute in Supercomputing.** Ithaca, N.Y., July 24-August 4 — Contact: Donna Smith, Conference Coordinator, Cornell National Supercomputer Facility, Summer Institute, Campus Road and Central Ave., Ithaca, N.Y. 14853-8301.

**Sparcintosh: The Imminent Collision Between Powerful Workstations and Lower Cost PCs Conference.** San Francisco, July 25-26 — Contact: The Yankee Group, 200 Portland St., Boston, Mass. 02114.

**Computer Security Conference.** Washington, D.C., July 26-28 — Contact: Digital Consulting, 6 Windsor St., Andover, Mass. 01810.

**DASD Storage Management.** Boulder, Colo., July 26-28 — Contact: The Institute for Information Management, P.O. Box 361556, Milpitas, Calif. 95035.

## JULY 30-AUG. 4

**Cinteract '89.** Orlando, Fla., July 30-Aug. 4 — Contact: Dee Ladenburger, Cincom Systems, 2300 Montana Ave., Cincinnati, Ohio 45211.

**National Association for State Information Systems 21st Annual Meeting.** Atlanta, July 30-Aug. 3 — Contact: NASIS, Suite 203, 350 Elaine Drive, Lexington, Ky. 40504.

**ACM Siggraph '89, Conference On Computer Graphics and Interactive Techniques.** Boston, July 31-Aug. 4 — Contact: Siggraph '89 Conference Management, Smith, Bucklin and Associates, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

## The sun is rising on IPM's new UPS.

It's a small UPS with big features, like system flexibility, attractive computer-room design and a contemporary, integrated cabinet at a competitive price.

The new Endless Power™ SP Series transistorized UPS and its matching battery pack can stand alone in the computer room or in a remote location.



They can also be assembled on site into a single unit. You can even add our matching standalone power distribution unit (PDU) to the system.

A state-of-the-art touch-screen CRT monitor panel is available on both the SP Series and PDU, giving you a user-friendly information center with

many helpful features.

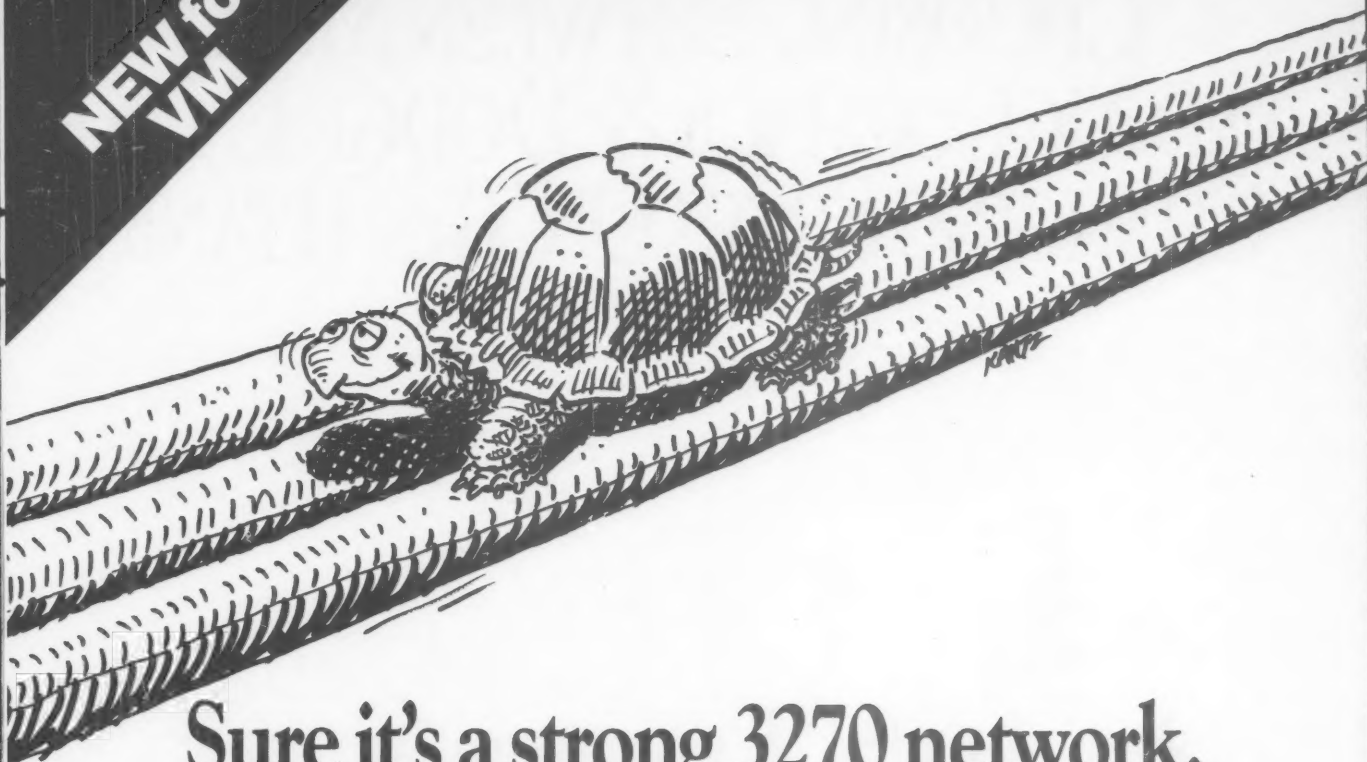
For more big news about the new, smaller, fully equipped UPS and other IPM products, contact

**International Power Machines**

Single-source power protection.

2975 Miller Park North, Garland, Texas 75042, 800/327-1208 (except Texas). In Texas, 214/272-8000.

**NEW for  
VM**



## Sure it's a strong 3270 network. But is it moving your information fast enough?

No matter how finely you have tuned your system, or how often you've invested in hardware and telecommunications upgrades, information never moves fast enough for today's data processing demands. Except when you install 3270 SUPEROPTIMIZER™ from BMC Software, Inc.—the one-time solution for response time problems.

BMC's patented technologies of IMAGING™ and Input Suppression™ assure you the maximum optimization of outbound and inbound data streams, which means messages travel faster across existing lines and process faster with existing hardware. You'll see up to 85 percent data stream reductions on local and remote 3270 networks, depending on the environment.

3270 SUPEROPTIMIZER is available for IMS, CICS, TSO and VM. You can have a dramatic response time improvement in less than one hour's time. To learn more, or to begin a 30-Day-Plus Free Trial of 3270 SUPEROPTIMIZER, complete and return this coupon, or call BMC Software, Inc. at 1-800-841-2031; in Texas call collect, 713-240-8800.

**BMC  
SOFTWARE**

**1-800-841-2031**

BMC Software, Inc. • P.O. Box 2002  
Sugar Land, TX 77487-2002

BMC Software also has offices in France, Italy,  
Japan, the United Kingdom and West Germany.

**BMC Software, Inc.**

P.O. Box 2002 • Sugar Land, Texas 77487-2002

Contact me about:

Free  
Trial

More  
Info

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 3270 SUPEROPTIMIZER™/IMS                 |
| <input type="checkbox"/> | <input type="checkbox"/> | 3270 SUPEROPTIMIZER™/CICS                |
| <input type="checkbox"/> | <input type="checkbox"/> | 3270 SUPEROPTIMIZER™/CICS<br>for DOS/VSE |
| <input type="checkbox"/> | <input type="checkbox"/> | 3270 SUPEROPTIMIZER™/TSO                 |
| <input type="checkbox"/> | <input type="checkbox"/> | 3270 SUPEROPTIMIZER™/VM                  |

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State/Prov.: \_\_\_\_\_

Zip/PC: \_\_\_\_\_

Telephone: \_\_\_\_\_

CW



Winner of the prestigious  
\$10 million in sales award from ICP:  
1986, 3270 SUPEROPTIMIZER™/CICS  
1989, 3270 SUPEROPTIMIZER™/IMS

# CHOOSING BETWEEN MSA AND MCCORMACK & DODGE IS LIKE CHANGING SEATS ON THE TITANIC.



She was a paragon of the world's technology, dubbed "the unsinkable ship." But what should have been an ocean-going triumph turned to tragedy due to poor planning, inept management, and lack of foresight.

Times haven't changed much.

In this day and age, the hazards of the software seas remain much the same. Poor product releases, inexperienced and ineffective customer support, and technological inflexibility riddle the mainframe software giants. The hidden costs of software and support still lurk beneath the surface. And changes decreed by IBM—such as SAA—make for even rougher seas ahead.

That's why if you're in the market for financial software, you shouldn't limit your choices to the old familiar names in the software industry to deliver you safely to your destination.

Instead, take a look at Data Design Associates. We run a tight ship at Data Design by following a few basic rules. No big secrets. Our product teams consist of seasoned financial and data processing professionals. We develop all our systems in-house. We listen to our customers. And we adhere to industry standards.

The results are impressive.

Built upon our *Eqqual*® architecture, Data Design's financial software is perfectly suited to meet your constantly changing corporate demands for hardware and software flexibility. And perfectly developed to conform to SAA standards.

In short, you get software that is more efficient, easier to maintain and install, and more responsive to your business needs than any other software solution available. All backed by the highest quality customer support in the industry. From

a company that has consistently increased sales and profit for over 16 consecutive years.

*Perhaps that's why over two-thirds of our clients previously used MSA and M&D financial software.* And why Alcoa, Bristol-Meyers, Esprit, MasterCard International, Pillsbury, Warner Lambert, and hundreds of other Fortune 1000 companies all rely on Data Design for comprehensive corporate financial management.

Don't wait for MSA and M&D to raise the Titanic. Call Data Design at (800) 556-5511. We promise you smooth sailing ahead.



**Data Design  
Associates**

**YOUR NEXT CHOICE**

Data Design Associates, Inc. is in no way affiliated with MSA or McCormack & Dodge. Eqqual is a registered trademark of Data Design Associates, Inc. Other product and company names are trademarks of their respective owners.

© 1989 Data Design Associates, Inc.



## Apple-linked group kicks off

BY ELLIS BOOKER  
CW STAFF

CHICAGO — If you are an information systems professional managing more than 100 Macintosh computers, MACIS wants you.

The national user group, which attracted a mix of 150 business and university users to its recent inaugural meeting here, was formed late last year at the suggestion of Apple Computer, Inc., which is also providing initial logistical and financial support to the group.

However, board members of MACIS (the name is derived from Managing Apple Computers in Information Systems) are evidently uncomfortable with questions about whether they will be a mouthpiece for Apple. The board has made clear that it intends the not-for-profit group to be self-sustaining within two years.

"The primary issue for most of us is operating Apple products in multivendor

environments," said MACIS President James F. Young. Young, assistant to the president at Electronic Data Systems Corp. in Dallas, said networking and communication issues were at the top of most member's agendas; thus, the seminar program at the inaugural conference was split into two halves — host integration and local-area network integration.

Under its bylaws, MACIS will establish formal lines of communication with Apple in Cupertino, Calif., for influencing Apple's development of products, policies and services. MACIS will also serve in the traditional user group role as a forum for members to share information.

Annual MACIS company membership fees are \$500 for one representative or \$1,500 for up to five representatives who can attend spring and fall meetings that the group plans to hold around the country. Member companies get a newsletter, on-line information through the Applelink network and MACIS survey results.

keting and business research. He said that while the department was using overnight mail services only three or four times a week, the process was too slow. Moreover, the overnight mail was more expensive than sending things via MCI Mail, Williamson said.

Because Du Pont was sending and receiving project proposals and bids that often required some reworking, some proposals were being sent back and forth up to six times, Williamson said. The process could take up to a week using overnight mail services.

"We encouraged our vendors to get an MCI account," Williamson said. "It is quite a significant time saver and not an insignificant dollar saver."

By sending nearly everything electronically, a contract can be passed back and forth many times in a single day, which saves time and money, Williamson said.

## IS delegation to Beijing is stunned by China crackdown

BY CLINTON WILDER  
CW STAFF

Several U.S. information systems professionals were in Beijing last month and observed the surge for democracy — then were stunned a few days after their return home to see that surge brutally turned back in the Tiananmen Square massacre.

Irvin J. Sitkin, the retiring top information systems executive at Aetna Life & Casualty, Inc., arrived in Beijing May 9 with 14 IS professionals and their guests under the auspices of People to People International, a U.S. organization for the promotion of goodwill among nations.

During a 2½-week journey to three Chinese cities and Hong Kong, Sitkin's group met with Chinese professors, engineers and managers involved with IS through the million-member Chinese Association for Science and Technology. The trip's tone was set early when the group watched hordes of peacefully protesting students fill the square.

"There was no sense of an imminent backlash," Sitkin said. "The police had no weapons, and the government actually sent buses in to shelter the students one night when it rained. It was truly a nonviolent situation."

Sitkin said one trip highlight was meeting Wan Runnan, the 42-year-old chairman and chief executive officer of Stone Group Ltd., owner of a fast-growing chain of stores selling computing equipment.

"It was like a session with Steve Jobs or Scott McNealy," Sitkin said. "Up to now, the government leaders had encouraged him, but I'm sure he'll have to be careful now. I'm sure someone in the government is thinking about whether that kind of activity should be allowed to prosper."

Sitkin said that since the June 3 massacre, more than 200 Americans in People to People International delegations have left China. All further goodwill trips have been cancelled through the end of July, and Sitkin said he expects all 1989 trips to be cancelled. "The implications for business are really quite negative," he said. "It will be a year or two before things can warm up again."

The U.S. delegation included Ed Kridakorn of Whitman Corp., Alan Haesche of Southern New England Telephone, Nick Blazensky of Travelers Insurance Co., Sandra Rux of AT&T, Lars Mattson of Digital Equipment Corp., Rachel Markowitz and Li-Hwa Ting of Aetna and consultant James Scott, formerly of Procter & Gamble, Inc.



Aetna's  
Sitkin

## Economies


CONTINUED FROM PAGE 61

according to Meldon.

"We want to get people in [the plaza] and onto the casino floor as soon as possible," Meldon said.

Still not satisfied, the casino began printing the coupon vouchers in type fonts that can be optically scanned at a quicker pace. "Before the computers, we were doing an average of 350 coupon redemptions each day," Meldon said. "Now, we are doing an average of 928 redemptions a day." Because of the quicker processing time, more coupons can be mailed out and more customers can be drawn in, he said.

Quick processing time was also sought within the polymer products department of Du Pont in Wilmington, Del., according to W. Randy Williamson, manager of mar-



# BIGGEST VIKING DISCOVERY SINCE NORTH AMERICA

## the VIKING DATA ENTRY SYSTEM

Discover a whole new world of low-cost, high-speed data entry efficiency with VDE, the Viking Data Entry system that gives you more data entry capability using a mini-computer/PC.

CALL TODAY FOR FREE DEMO  
918/491-6144

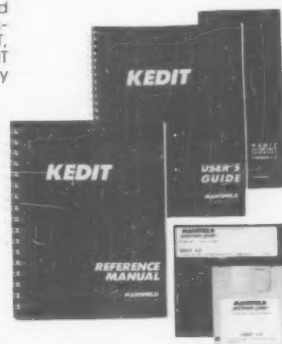
**VIKING SOFTWARE SERVICES**  
4808 E. 67th, Suite 100 • Tulsa, OK 74136

## KEDIT 4.0

### XEDIT COMPATIBLE PC EDITOR

KEDIT™ is a text editor for DOS and OS/2 that supports most commands and features of XEDIT, IBM's editor for VM/CMS. But KEDIT goes beyond XEDIT compatibility with special PC-based features for a first-rate combination of mainframe power and PC flexibility.

- More than 100 XEDIT compatible commands and SET options, including the ALL command.
- XEDIT prefix commands, targets, and fullscreen layout.
- Multiple files, multiple windows.
- Built-in subset of the REXX macro language included.
- Interfaces to Personal REXX, our complete implementation of REXX.
- Enhanced block operations.
- And much, much more.



"While KEDIT remains true to its heritage in retaining compatibility with the mainframe XEDIT, it is also one of the most feature-packed PC text editors around." PC Magazine, 10/31/88

**MANSFIELD**  
*Software Group*  
P.O. Box 532, Storrs CT 06268  
(203) 429-8402

KEDIT Version 4.0 is available at \$150; OS/2 version is \$175. Add \$3 shipping. MC, VISA, American Express. Demo version available.

KEDIT is a trademark of the Mansfield Software Group, Inc.

# TAKING CHARGE

Paul Roemer

## Failing IS grades



A recent Coopers & Lybrand survey of more than 200 directors of information systems in the Rocky

Mountain region revealed that more than half of the respondents do not have a formal IS plan or methodology. These same companies have IS budgets that exceed \$5 million.

Furthermore, those who responded issued themselves report cards describing how well they feel they are serving their users. Their average score was no better than a C-minus.

These two factors should be raising red flags throughout these organizations. The systems directors and their supervisors should be considering why millions are being spent on a service that does not have much perceived value. They should also question how it is possible to spend millions each year without a plan in place to monitor that expenditure.

Did you ever notice how difficult it is to get approval to build a new plant or to get the funding for a new product line? These types of endeavors seem to require approval from almost everyone in the organization.

This makes good business sense; management wants answers to some basic questions. If you were asking for \$10 million to build a new widget plant, you would be prepared with answers to the following questions:

- How will this plant more effectively support the organization's mission?
- What resources will be required, and how will they be employed to achieve the desired result?
- Will this plant focus the organization's resources on the highest priorities?
- What plan or methodology will be used to ensure that the end result matches the desired result?

If you have done the proper amount of homework, not only will you receive all of the required approvals to start the project, but you also will likely receive the management support required throughout the project's life.

The same thought process ought to take place within a company's IS department. All too often, systems planning is no more than a budgeting exer-

cise. If this year's IS budget was \$10 million, next year's budget will be \$10 million with a percentage increase or decrease. Why is this the case?

There are two reasons. First, everybody in the department seems to be busy working on various projects this year, and there is no reason to believe that they will not be just as busy working on similar endeavors

next year. However, little or no attention is paid to just how important these projects are.

Second, managers tend to be rewarded based on the size of their domain. If all of the other department heads receive a 10% increase in their budgets, then the IS manager will also "need" a 10% increase. It is a little like keeping up with the Joneses.

The blame for this practice

must be shared, however. The responsibility lies in part with the executive management of the organization. If the IS department reports to the chief financial officer or the president, these individuals should be asking their IS departments what they plan to do with the next \$10 million. These same executives make the director of manufacturing jump through hoops to

get the widget plant approved. They ask to see projected sales figures, cash flows, staffing levels and blueprints.

Part of the problem is that it is easier to measure the success or failure of the widget plant. If the plant is supposed to make 1,000 widgets a month, it is pretty simple to determine how many were actually produced. The president can walk through

© 1989 Computer Associates International, Inc., 711 Stewart Avenue, Garden City, NY 11530-4707



the plant and proudly display the first widget produced on a pedestal in his office. Very few presidents will proudly display the first report produced by the new computer.

Many IS managers are in the habit of acquiring things. They perceive a need for a relational database, a fourth-generation language or new workstations. These needs are often approved

because the individual with the responsibility to authorize the expenditure rarely knows the right questions to ask. He is afraid to ask the IS manager for justification out of a misplaced fear of looking uneducated.

Every firm and its IS department should follow two axioms:

- If you have a budget, you should have a plan.
- If you do not have a plan, you

should not have a budget.

The remaining challenge is how to develop the plan. A proper planning approach should use a structured methodology. You wouldn't just sit down and knock out an IS plan anymore than you would knock out a blueprint for a widget plant.

Obviously, there are some costs associated with developing a good plan. If the methodology

is properly employed, the costs will be much less than those associated with not having a plan. A well-thought-out plan can help make the IS department employees into heroes within the organization, both internally and externally.

Roemer is manager of management consulting services in the Denver office of Coopers & Lybrand.

## MANAGEMENT BRIEFS

## Spotlight on 3090s in IBM contest

Are you or your company using IBM's 3090 in interesting ways? IBM is calling for papers for its 1989 IBM 3090 Supercomputing Competition and is offering \$200,000 in prizes for papers that describe innovative applications for the 3090.

The contest, open to authors in the U.S. and Canada, was designed to inspire the development of original supercomputer applications in engineering, the sciences and the humanities, the company said.

Individuals or teams of individuals should submit papers in one of the following four categories: physical sciences and mathematics; engineering; life and health sciences; and social sciences, humanities and the fine arts.

In order to win an award, a paper must make a significant contribution to the art of large-scale computational analysis and modeling and demonstrate how a 3090 with a vector facility contributed to the project.

First prize is \$25,000; second prize is \$15,000, and third prize is \$10,000. Moreover, colleges and universities that support the work of first-prize papers in each division will be awarded \$10,000.

Contest registrations must be postmarked by Oct. 2, 1989. Winners will be announced by March 1, 1990.

For more information, contact IBM, Dept. 72/BNG, 44 S. Broadway, White Plains, N.Y. 10601-4495.

**The National Computer Graphics Association** is calling for papers and presentations for NCGA '90, which is scheduled to be held March 19-22, 1990, in Anaheim, Calif.

Presentations sought will report on and evaluate recent developments, trends and new, innovative applications of computer graphics; examine philosophical, theoretical and historical information about computer graphics applications; provide solutions to fundamental user problems; and review case histories showing how computer graphics have been used to increase productivity in industry, business and research.

Anyone interested in presenting a paper at the show should submit a 500-word abstract to the association no later than Aug. 1.

For more information, contact Mary Geary, NCGA education coordinator, Suite 200, 2722 Merrilee Drive, Fairfax, Va. 22031.

## With Masterpiece There's Only One Other Piece Of Financial Software You'll Ever Need.

The promise of financial accounting software is realized at last. Masterpiece® is 21st century financial management for the entire corporation. From the data processing room to the executive suite.

It's comprehensive. It's fast. It integrates all your data and puts it into the most accommodating user environment you'll ever work in.

For those at the top, Masterpiece provides information with speed and accuracy. Decision making becomes easier. Data is disseminated company wide at your command. Profit forecasts are at your disposal quickly and easily. You've got state-of-the-art graphics to help present your case. And more importantly, you suddenly have the powerful sensation of knowing where you stand at any given moment.

Masterpiece is not business as usual, but business as it is about to become. For IBM Mainframe, Midrange and Digital VAX environments, it's the financial software of the future—that's available today.

For more information call Chris Andrews at 800-841-3734 (in Calif., 800-468-0725). And find out what 21st century financial software can do for you.

**COMPUTER ASSOCIATES**  
Software superior by design



# Today's DisplayWrite. Word processing that works for you on many different levels.



The word processing  
standard, company-wide.

And worldwide. IBM DisplayWrite®

word processing can handle any job, at any level, from one end of your company to the other.

Which is why DisplayWrite is a standard from one end of the Fortune 1000 to the other.

The DisplayWrite family covers everything from basic text editing to text-and-graphics design. So no matter how fast you grow, you won't outgrow DisplayWrite.

For DOS, DisplayWrite writes a  
whole new chapter.

DisplayWrite 4 Version 2™, the most powerful DOS version ever, now gives you convenient pulldown menus, and easily handles multicolumn text. It works with more than 60 printer models, IBM and non-IBM alike. There's even a free user support hotline. The powerful spell-checker uses multiple dictionaries in one pass, a timesaving DisplayWrite exclusive. There are optional dictionaries for legal/medical terms and 17 foreign languages. DisplayWrite also works with IBM mainframe hosts and LAN environments, including the new IBM OfficeVision/2 LAN series.

DisplayWrite and the power

of OS/2. For OS/2™ users, DisplayWrite 5/2 has all the features above, and more. You can multitask, to work on multiple documents simultaneously. Choose easy menus or speedy fast-path commands. Consult online help screens anytime. And the optional Composer™

Extension adds sophisticated graphics and page layout features.

To get on the DisplayWrite standard (or discover how most current DisplayWrite users can upgrade for under \$100), call your IBM Authorized Dealer, IBM marketing representative or 1 800 IBM-2468, ext. 126.

Let today's DisplayWrite take your written communications to the high-level yet.

**IBM®**

DisplayWrite 4 Version 2, Composer and OS/2 are trademarks and IBM and DisplayWrite are registered trademarks of International Business Machines Corporation. © IBM Corp. 1989



# EXECUTIVE REPORT

## ORGANIZATIONAL IMPACTS OF DOWNSIZING

RESTRUCTURING  
OF IS

### Changes that are more than CPU-deep

BY STAN KOLODZIEJ

**D**ownsizing changes a lot more than the size of systems. The methods and technologies that are being used by information systems organizations to improve efficiency and distribute information resources more broadly throughout corporations can also alter the IS function — in ways that range from administrative detail to overall structure.

At the most basic level, keeping track of smaller systems, both in terms of whereabouts and cost accountability, introduces a whole new level of complexity in IS record-keeping.

For Ed Burns, vice-president of data center operations at CIT Group, Inc. in Livingston, N.J., downsizing means portability, and "that can mean a bigger headache in keeping track of inventory."

Joe Cloonan, controller of MIS at Gillette Co. in Cambridge, Mass., also worries about keeping track of a widely dispersed inventory of computers and peripherals. However, what concerns him even more is the complexity of chargeback billing now that the company's networks and network file servers are handling more users in more departments.

The administrative adjustments that Burns and Cloonan point to are really just the tip of the iceberg in terms of the kinds of changes that downsizing can set in motion. Some IS organizations find that the shift to smaller platforms requires a whole new skill set for programmers.

In many places, previously sedentary staffs are learning about rapid mobilization for operations in the field. And, in what is probably the most profound and prevalent change of all, downsizing throws IS staffs and client organizations together in unaccustomed proximity and partnership.

At Citibank N.A.'s Consumer



**Citibank's Contorno says networked workstations beat mainframes for rapid response and user involvement**

Services Group-International Systems (CSG-IS), for example, Vice-President Joe Contorno says that by using workstations and IBM Application System/400s as the primary development platforms, his group has been able to achieve far greater levels of responsiveness and strategic involvement in client businesses than would be possible with a mainframe.

About eight years ago, the CSG-IS group was formed to support Citibank's overseas retail operations. It uses 15 Stratus Computer, Inc./IBM System 88 front-end processors to sup-

port remote interactive development for 40 different businesses located predominantly in Europe and the Far East from offices in New York, London and Manila.

According to Contorno, using networked workstations permits greater client involvement in the development process, and that is both more efficient and more practical in a situation in which local business practices may differ from one client organization to another.

Typically, CSG-IS performs 70% of the development work on an application and then lets the local business unit add the

finishing touches and local flavor. "We'll handle application design and architecture, and we'll develop the code," Contorno explains, "but we'll leave things like the local MIS reporting system and foreign languages to the client businesses."

This client participation, combined with the greater development speed achievable on workstations, means faster turn-around of applications. "Our group is more responsive and quicker to act than most mainframe [IS] organizations," Contorno says. "We get a framework in place quickly to handle all crucial parts of a project."

As an example, he cites an automated teller machine installation project that CSG-IS handled for a bank in Hong Kong. Contorno says he is convinced that the applications, which took his group a few months to complete, would have required at least a year of mainframe development time.

Proof of efficiency is in the numbers, and CSG-IS has racked up such an impressive record that other IS organizations within Citibank's separate Institutional and Sovereign banking divisions are beginning to examine CSG-IS' architecture as a possible alternative to their own mainframe-based setups. CSG-IS' front-end systems unit, which started out servicing five overseas businesses with a development staff of 26, now handles 40 businesses with 23 developers.

At least as important as the dollar efficiencies is the fact that CSG-IS has been able to build a multilevel relationship with its client organization. It consults with them on strategic technical directions and technology implementation as well as serving as a liaison for resource sharing between geographically dispersed businesses.

Team efforts between IS and users for specific downsizing projects often produce a real and lasting synergy. That is what happened at Chrysler Financial Corp. in Troy, Mich., as a result of the decision to revamp the company's host-based financial

#### INSIDE

#### Learning to work with the locals

Page 76

#### The importance of context

Page 77

#### There can be muscle without big iron

Page 78

Kolodziej is a senior editor for *Computerworld Focus on Integration*.

## Challenges

CONTINUED FROM PAGE 71

services system.

Three years ago, Chrysler Financial's operations division put pressure on its IS department to change its system, which it felt was so slow that it was probably losing business for the company.

Dave Hamilton, home office operations specialist at Chrysler Financial, says the scope of the project also required redefining the relationship between IS and operations at the firm.

"The normal procedures, where we'd put a job request through the proverbial slot in the door and then wait for a reply, wasn't going to do it," Hamilton explains.

IS and operations wound up working closely together, learning each other's territory.

"It's not that we didn't know how some of the other side worked," Hamilton says, "but we really had to get to know each other's operations pretty thoroughly to make this project a success."

A team of eight key people from operations and IS collaborated. According to Gene Martyniak, branch automation project manager at Chrysler Financial, both sides learned more about each other's operations by defining joint requirements and coming up with solutions together.

"It was an important learning curve for MIS and users," Martyniak observes. "Instead of one side dictating to the other, MIS got closer to what users needed, and users now know how to better take

advantage of MIS resources."

Eventually, a distributed network of AT&T 3B2 workstations and terminals was put into place at the 116 branch offices in the U.S. and Canada.

The new arrangement has had dramatic effect on productivity, Hamilton claims. But, he says, the transformation of relations between IS and the business units has been even more impressive.

"The relationship between ourselves and MIS has changed drastically," Hamilton says. "Now, other [Chrysler Financial] divisions such as credit and wholesale

**I**T'S NOT that we didn't know how some of the other side worked, but we really had to get to know each other's operations pretty thoroughly to make this project a success."

DAVE HAMILTON  
CHRYSLER FINANCIAL

are interested in forming teams with IS to handle their own applications. And eventually, many such applications will have to be integrated."

### Olympic-size changes

Downsizing is also changing the dynamics of IS and user relations in the government offices of the state of Washington.

Programming resources from the central IS organization in Olympia, Wash., have been gradually migrating into the engineering and financial departments, in which new applications are co-developed with users on IBM Personal Computers and compatible microcomputers, according to Bill Storms, computer information consultant.

"We've reached the stage at which our mainframes are used basically as large data repositories," Storms says. "This is a major way we are restructuring ourselves to better support and get closer to end users."

Storms says his IS department now forms "crews" of programmers, who go into various engineering and financial departments to handle multiple programming projects with end users.

"Users previously were directed to go through the information center for new applications," he recalls, "but it proved to be less productive than IS going directly to the users to get things done."

User applications are now built faster and are more on the mark, closer to what

the users really need, Storms reports. But, he adds, information center employees have found it necessary to train IS programmers on many of the methods used in programming with PC software.

There is little question that the downsizing of systems alters the skill requirements for IS staff. As the IS function becomes more integrated into business strategies and corporate infrastructures, IS personnel are being asked to learn not



PETER YATES/PICTURE GROUP  
**Chrysler Financial's Hamilton (left) and Martyniak say downsizing brought their departments closer**

## CONSIDERING A CONVERSION?



### MIGRATION MASTER™ FROM SEED. IT'S YOUR BEST RESPONSE TO CHANGING ENVIRONMENTS.

Migration Master from SEED Software Corporation is a unique approach that simplifies the conversion of software between operating environments.

- Consider the benefits Migration Master offers:
- Creates a functionally identical system.
- Reduces the man effort and elapsed time required to complete a software conversion.
- Automated and repeatable process, without "freezing" critical applications.
- Migration of all aspects of your application.

- Tool for software configuration management and documentation.
- Provides for coding standards enforcement.

When you consider all of the advantages Migration Master has to offer, we think you'll agree that Migration Master is the most cost effective way to convert your software.

If you would like more information about Migration Master, call Toll Free (800) 445-3267. In Virginia call (703) 960-8800. Or write for more information.

# SEED®

SOFTWARE CORPORATION

5904 Richmond Highway • Alexandria, Virginia 22303  
Your best response to changing environments.

only about the businesses they service but also the intricacies of networks and PC-based development.

"When I started in this [IS] business 20 years ago, it was strictly IBM and Cobol," explains Rick Napier, general manager of Healthnet Corp., a Richmond, Va., service bureau. "Now, we're using techniques like [software] entity modeling, CASE and PC front-end software development, and then we have to tie together some pretty sophisticated networking."

Napier says he is also positive that downsizing is changing the rules of the hiring game. "The changes brought about by downsizing generally require a new type of programmer — someone willing to try something new."

For his part, Napier says he has been hiring programmers who are generally younger and do not have the baggage of a long history of mainframes behind them. Such programmers, he claims, are more apt to be open-minded about new programming and IS organizational changes.



MANUELO PAGANELLI  
Healthnet's  
Napier

"You say CASE and PCs and that's not sexy to the 15-year IMS bigot with his hands on a mainframe terminal; it is sexy, however, to young programmers who have their hands on Macintoshes and PCs," Napier says.

Downsizing is also altering the rules of organizing software application development. Michael S. Scott Morton, a professor at MIT's Sloan School of Management, says that changes brought about by downsizing enable IS, like the corporations they serve, to quickly "freeze, unfreeze, then freeze again" around certain tasks. The emphasis is on quick response to projects and flexibility in IS structures. Advances in application development tools and smaller systems are helping support these IS efforts.

#### CASE creations

Dennis Lockard is manager of information resources at the recently formed Corning/Asahi Video Products Co., a joint computer monitor manufacturing venture between Corning Glass Works and Asahi, a Japanese electronics firm. Lockard reports that his company, which is based in Corning, N.Y., is planning to use workstations and computer-aided software engineering (CASE) tools to create new engineering applications more quickly.

What Lockard wants to avoid, he says, is the strict, hierarchical mainframe-based mode of software development used by his former employer, Corning Glass Works. With IS and manufacturing facilities at Corning/Asahi being built from the ground up, Lockard says he believes he has a good opportunity to utilize downsizing to change the rules of software development right from the beginning.

"I want to build [IS] teams that will work closely with our manufacturing people on various projects; they should not be bogged down by one large, monolithic project," Lockard explains. He adds that smaller systems and the software tools available today enable application development teams to decrease the time required to build new applications, with a

**O**NE THING IS clear: IS is a long way from the days when it was viewed as an isolated, back-room operation, charged with the responsibility of reducing clerical costs but basically sheltered from the economic movements of the outside world.

minimum of programming manpower and costs.

Gopi Balija, until recently the director of strategic systems development at New York advertising firm Ogilvy & Mather and now president of consulting group Strategic Informatics Resources Corp. in New York, says that he learned a great deal from forming CASE teams of applica-

tion builders at Ogilvy & Mather.

"CASE will soon be used for building mission-critical applications," Balija says, with workstations as a major platform. "In the past, faster computer chips have covered the sins and omissions of MIS," he says. "The increasing speed of hardware could compensate in many cases for poor software development. Now, the

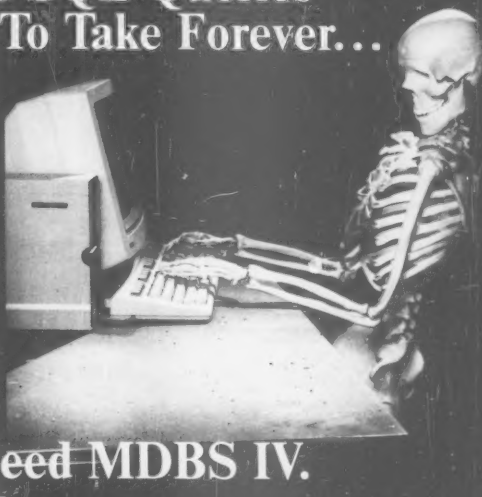
changes in business are placing great emphasis on what IS managers are capable of in a more fundamental, strategic way. Those who cannot adapt their IS culture to these changes will be in trouble."

One thing is clear: IS is a long way from the days when it was viewed as an isolated, back-room operation, charged with the responsibility of reducing clerical costs but basically sheltered from the economic movements of the outside world.

Downsizing, in combination with economic and technological trends, is constructing an entirely new set of governing principles for IS.

"If there's one imperative now for IS," Sloan's Morton says, "it's the crucial management of change." •

## If Your SQL Queries Seem To Take Forever...



## You Need MDBS IV.

#### Performance.

MDBS IV provides the superior performance that your on-line, mission critical applications require. Even on a microcomputer LAN with dozens of concurrent users, MDBS IV can access multiple gigabyte databases and offer sub-second SQL query response times.

#### Integrity.

MDBS IV also provides features such as abortable transactions and two phase commits, which protect the integrity of your database. In addition, the very nature of MDBS IV's treatment of data relationships guarantees referential integrity.

#### Client/Server Architecture.

Today many DBMS vendors are claiming data base server technology is new. We installed our first data base server in 1984. With 150,000 installations worldwide, we have perfected what others have only begun to explore.

#### Portable.

MDBS IV is available on a wide range of micros, LANS, minis, and work stations. It is also being ported to the mainframe environment.

MDBS IV is one component of the mdb Technology Platform. This platform is woven of products and services designed to work together to provide a powerful, synergistic approach to applications development. Components of the mdb Technology Platform include expert systems, relational DBMS, object oriented tools, consulting, support and training.

Find out more about MDBS IV and our FREE Technology Symposium. Send or FAX us the coupon below or call (800) 344-5832. In Indiana call (317) 463-2581 and in Canada call (416) 733-3299.



mdb, Inc.  
Two Executive Dr.  
P.O. Box 248  
Lafayette, IN 47902  
Phone: (800) 344-5832  
FAX: (317) 448-6428

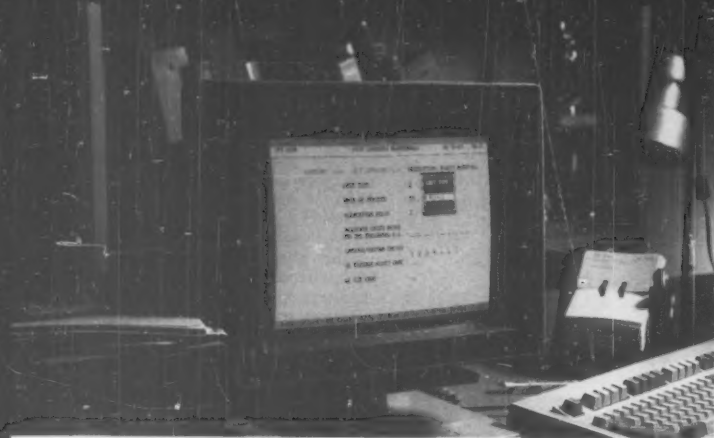
Send me information on:

- ☐ MDBS IV  
☐ Technology Symposium

Mail or FAX with your business card to:  
mdb, Inc.  
Two Executive Dr.  
P.O. Box 248  
Lafayette, IN 47902  
FAX: (317) 448-6428

mdb and MDBS IV are Registered Trademarks of mdb, Inc.

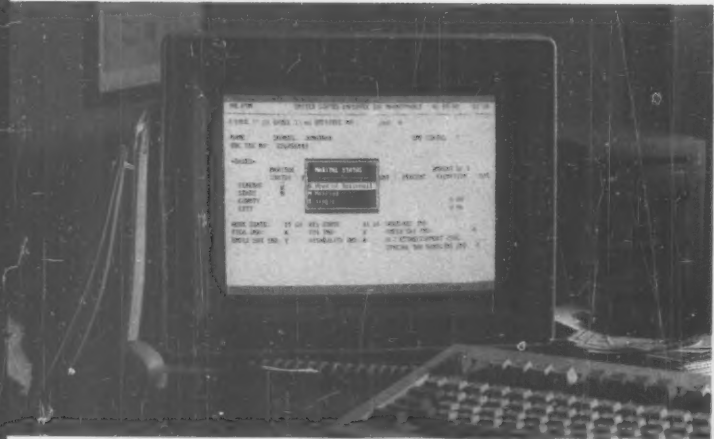




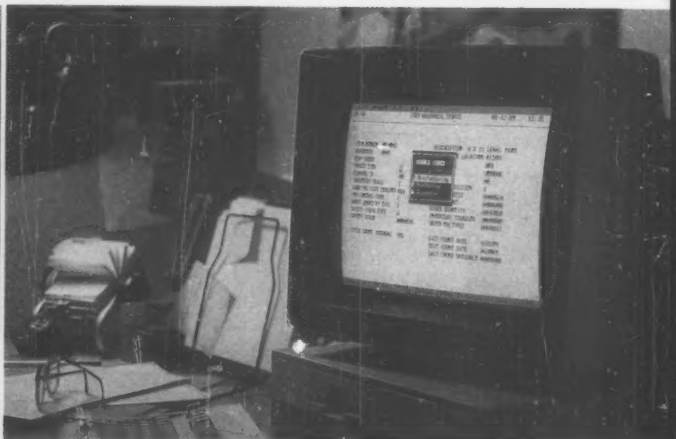
BrightView Project Tracking



BrightView General Ledger



BrightView Payroll/Personnel



BrightView Inventory



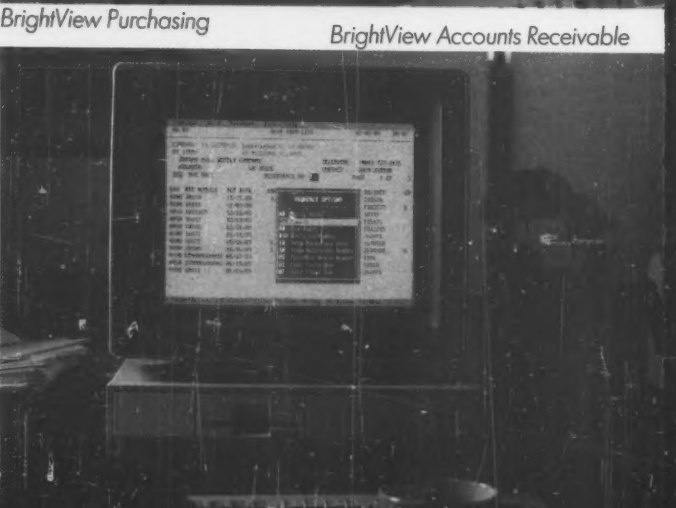
BrightView Accounts Payable



BrightView Purchasing



BrightView Fixed Assets



BrightView Accounts Receivable



## **At last, everyone in your organization will see things the same way.**

No, we haven't stumbled upon a formula for peace, love and understanding.

We have, however, created BrightView.<sup>™</sup> A revolutionary new line of applications software that presents a common face to the user regardless of the application. So when it comes time to switch from General Ledger to Fixed Assets, for instance, you get a distinct sense of déjà vu. And long, costly training sessions are suddenly a thing of the past.

MSA is committed to delivering the most extensive line of SAA-compliant software in the industry. In fact, BrightView applications software already complies with SAA's most advanced component, Common User Access. So keyboard functions, screen colors and pop-up windows remain consistent.

In addition, BrightView offers you the ability to get the most from your intelligent workstation (IWS)—through the power of cooperative processing. Now, tasks that used to require expensive mainframe resources can be executed in the friendly and cost-effective environment of the IWS. Users are far more productive, while host capacity is used where it's needed most.

So, whether you're accounting for receivables, or taking new tax laws into account, using MSA's new BrightView Series of Financial applications will be to your credit.

To get an even clearer picture of BrightView, just call Robert Carpenter at 404-239-2000. People won't just see things the same way. They'll see results they've never seen before.

The logo for Management Science America (MSA) features the letters "MSA" in a bold, stylized, blocky font. The letters are closely spaced and have a slightly irregular, hand-drawn appearance.

*The Software Company®*

## Distributing applications can result in a new outlook for IS

BY DAVID OWEN

What do you get when you cross technologically savvy users with microcomputers and minicomputers that can outstrip the price and performance of hardware platforms twice their size? Answer: A substantially different approach to information systems management.

Financial considerations alone are enough to guarantee that companies will eventually distribute more of their appli-

cations onto smaller, local processors, directly serving the requirements of their user groups. This change from a rigid, centralized data processing function to a more fluid arrangement with independent nodes will require a number of organizational and managerial changes on the part of IS.

Much of the processing now taking place centrally will take place locally, and the local sites will require a totally different type of support.

Instead of having narrowly defined job descriptions, central IS staff will become highly autonomous, with a primary role as on-call providers of assistance for local users.

These local users, in turn, will have acquired their own specialty support staff to handle many of the tasks that the central IS group now performs — jobs such as package selection, software development and maintenance and simple hardware and operational management.

Because of this staff increase in the local sites, the numbers of overall IS-related staff will actually increase temporarily. However, after some time, requirements for centralized personnel will decrease and local personnel will increase until a staffing balance is achieved.

There will be great potential for overlap and confusion between central IS and local support staffs; therefore, it will be up to IS management to clarify roles and responsibilities for all personnel involved in supporting and managing information technology.

If, for example, one group has a high degree of expertise in selecting and implementing local-area networks, it makes sense for all the groups to utilize this common resource rather than each group duplicating the resource for itself, at significant cost.

The central IS staff will not disappear, but in this environment, it will need more than ever to have a distinct customer service orientation.

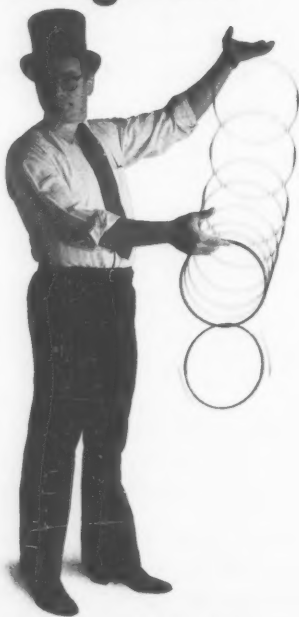
This has to be instilled in every member of the organization, because the local users will turn to the central staff only as long as it is able to provide them with a more convenient, cost-effective service than they can provide for themselves.

If the local users ever reach a point at which they believe they can provide their own service more effectively, rapidly or courteously, the central IS function will lose its authority in that area and the organization as a whole may become less efficient.

The next thing IS management needs to do is take an active, rather than a passive, role in advancing this trend.

Many IS departments ignore the distribution of applications into the local sites; they prefer to pretend it is not a sig-

**"Vitalink  
connected our token rings.  
Now our users think  
I'm a magician."**

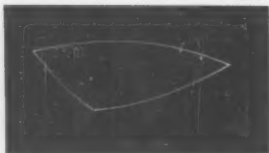


No smoke and mirrors. Vitalink's new TransRING bridges connect token ring networks to form a single, high-speed, wide area network.

Even when you want to run dozens of different applications and protocols, our TransRING lets you link all your sites over thousands of miles. Your users

benefit from better connectivity and improved response times. They'll process more transactions, bring products to market faster, or simply get information sooner.

If you're ready to work magic with your network call Vitalink. The LAN Bridging Company. 800-443-5740 or 415-794-1100.



**VITALINK**  
The LAN Bridging Company

**I**F THE LOCAL users ever reach a point at which they believe they can provide their own service more effectively, the central IS function will lose its authority in that area.

nificant issue and provide only minimal support.

Ironically, it is this very lack of support from a central IS function that leads most user organizations to acquire their own expertise. If IS were to provide them with assistance and guidance throughout their selection, installation and use of distributed solutions, they would undoubtedly accept it.

Finally, IS must manage the spread of alternative processing platforms. At one level, this involves setting standards in areas such as local-area network types, packaged software solutions, documentation and testing standards.

At a more active level, it also involves managing those elements of the entire environment that are common or stretch between sites and are necessary for the smooth functioning and integration of the entire computing resource. Examples of such elements include network management, data backup and Help desk functions.

The trend toward moving applications to smaller, more distributed platforms is inexorable. With the proper IS initiative, the transition can be made smoother and shaped in a way that will help your organization thrive. •

Owen is an associate in the Information Management & Systems practice of Temple, Barker & Sloane, a general management consulting firm in Lexington, Mass.

## INTERVIEW

## Context is everything

*There are ways that downsizing can work to the advantage of IS, says Index Group's Cyrus Gibson. But this kind of move should never be made rashly.*

If approached properly, downsizing can work for rather than against the information systems organization, according to Cyrus Gibson, a senior vice-president at Cambridge, Mass.-based research, education and consulting firm Index Group, Inc.

"Downsizing" has acquired a negative connotation as a result of its frequent association with cost-cutting and staff reduction. But Gibson, who works in Index's executive education and organizational change services group, suggests that there can be some real benefits for IS in taking a stance to foster system and application downsizing when appropriate. The key word, however, is "appropriate."

As Gibson pointed out in a recent interview with *Computerworld* Features Editor Joanne Kelleher, the real danger of downsizing is that it may be seen as a universal answer, when, in truth, it is nothing more than a reasonable approach to specific conditions.

**What do you think people think of when they hear the word "downsizing"?**

In most of the cases I've encountered, the interpretation, at least when the initiative comes from outside IS, is reduction of costs and staff.

**Would you say, because it is so often linked with cost-cutting measures, that the idea of downsizing has taken on a largely negative meaning?**

I think the term does have negative implications because of the way it has been used. Of course, reduction of corporate costs is beneficial or at least visible in the short term. Such reductions will be a high priority for most major firms over the next five to 10 years. Actually, IS managers ought to see some opportunities in that situation.

**What kinds of opportunities?**

The opportunity to reduce their own costs, possibly by downsizing to more efficient software and hardware architectures, and the opportunity to demonstrate to senior management that IS can serve as a strategic means

for downsizing the rest of the corporation.

**You mean by finding ways that systems can facilitate staff reductions in areas of the company other than the IS organization?**

Exactly right. If IS is good for anything in a corporate strategy, it ought to be good for providing the means to redesign work and facilitate the substitution of capital for labor among the users; that is to say, helping them reduce staff. And it may even be justifiable for it to do that at a constant or increasing staff rate of its own.

**How is that likely to go over with some of the other departments?**

It all depends on how it is sold. If corporate management understands a role like that, and tells the other departments, "You should use the resources of information systems as a means to help you achieve your goals of staff reduction," then it could be seen as a way to help.

But you are right: Initially and the way most companies are set up for budget allocations, it is more likely to be seen as a competitor for limited funds than as a savior.

**Besides the cost advantage, do you see other reasons why it would be good for IS organizations to look seriously at smaller platforms and downsized applications?**

If we assume for a moment that there are real processing efficiencies to be had from downsized systems — networked workstations and so on — it seems to me that such an architecture could achieve a higher degree of integration between technology and work process.

I'd say the downsized systems concept is more compatible with that setup than is the more traditional concept of major systems built at arms' length by a central utility or contractor. It is a more interactive approach and puts more of the development function on the user, which is probably appropriate given that corporations in the future are likely to require a more creative work force.

**You don't, however, see system downsizing as appropriate in all circumstances.**

No, I definitely don't. I think that downsizing, along with other trends and opportunities, simply needs to be evaluated in the light of what a company's business requires. It is an old saw: Those of us on the technological side need to be constantly reminded that just because it is possible to do something with technology does not necessarily mean you should do it for a given business.



**So you think that there may be a danger that companies will get carried away and downsize things that should not be?**

I guess if there were a piece of advice I'd offer, it would be to act like you are from Missouri when it comes to anything that seems like a universal panacea. We are all looking for answers that are as universal and as easy as possible, but I just think the technology is now so powerful that we need to be careful.

With downsizing, we are still just looking at one small part of what a company's technological strategy should be. In fact, that small part is really a piece of the architecture strategy. I personally believe that we don't know what the future is going to look like; rather than advocate universal principles like "Downsized software or workstation networks are better," we should be looking at those possibilities

on a company-by-company basis.

**Could you suggest some instances in which downsizing of systems would not be appropriate?**

In some instances, a company's software architecture might better be handled in a relatively traditional way, at least in the foreseeable future, because its business requirements are transaction-intensive. That would apply to things like certain functions in the back office of financial services businesses or airline reservation systems.

I think we are probably approaching the time when breakthroughs in downsizing, even for some of those systems, may occur. In the meantime, however, for the sake of reliability and security, some of those critical operational systems probably require a somewhat traditional architecture.

**How about long-term? Are there any good reasons why companies may not want to downsize their systems at all?**

Actually, I think that some of the most progressive uses of technology right now represent movement in the other direction.

In fact, a lot of companies are looking at the IS resource as a critical means to maintain communications and centralize many operations that were only decentralized because there wasn't the kind of information available before for them to be run effectively on a centralized basis. In other words, the technology now enables us to do some things as a business that are highly centralized.

One example that comes to mind is Otis Elevator, Inc. With the Otisline system, the company substituted many of the functions previously carried out in a highly decentralized service organization all over North America with a single 800 number to Hartford, Conn.

They were able to improve  
*Continued on page 79*

# Learning to flex new muscles

When systems shrink, IS managers find that knowledge can be power

BY ARIELLE EMMETT

Is there hope for stature when your big iron is gone or a measure of prestige that can replace MIPS?

Leonard Murrell says yes. That answer should be comforting for all the information systems managers and personnel now contemplating the possible impact of downsizing on their role and corporate standing. Murrell knows because he is a survivor of a downsizing experience in the very worst sense of the term — the kind that slices not only systems but staff and budget.

As part of a corporate belt-tightening effort that began in January 1988, Murrell and his staff at Borg-Warner Corp. switched from an IBM 4341 mainframe to a 70-station Novell, Inc. personal computer-based local-area network. In the process, the 10-member IS staff was reduced by four, including the IS director and a manager [CW, May 22].

Far from losing heart, however, Murrell, who is manager of

systems and programming, claims that downsizing has made life and work at Borg-Warner's corporate headquarters in Chicago more challenging.

"The prestige of our shop is still there because we feel we're

**T**HE ultimate status symbol is when the IS manager is perceived as having a measurable impact on revenues and profits."

THOMAS J. O'FLAHERTY  
BROADVIEW ASSOCIATES

on the leading edge of technology," he says. "MIS people now look at themselves as being knowledgeable about two worlds — both personal computers and mainframes."

In some cases, the transition from glass house to a leaner, meaner IS shop can be traumatic, according to Roy Prater, vice-

president of IS at Atlanta-based Cox Cable Communications. The cable television company, a division of Cox Enterprises, Inc., went through a massive system and staffing decentralization and downsizing project in the mid-1980s.

"The biggest problem of downsizing is the effect it can have on employees within the organization," Prater says. "The mentality of IS is based on who has the big iron and the millions in budget, on who is in charge of 200 or 300 employees. You get used to delegating to a lot of subordinates, and you're accustomed to people referring to you as the guy who runs the big shop. You look at that mentality, and when you decentralize and also downsize, that's not true anymore."

## No more MIPS lifting

Indeed, many experts agree that downsizing is already changing the essential measures of IS' worth in the corporation.

"There are still some people who can measure their worth by iron and MIPS, but it's getting

harder," confirms Thomas J. O'Flaherty, director of research at Broadview Associates, an information technology firm in Fort Lee, N.J., that specializes in tracking mergers and acquisitions.

Instead, he says, managers will have to get used to the kinds of measures of worth that their organizations are starting to emphasize. In the future, O'Flaherty predicts, managers will be measured and rewarded on the basis of their ability to improve things at the corporate bottom line.

"The ultimate status symbol in the corporation is when the IS manager is perceived as being useful and having a measurable impact on the company's revenues and profits," O'Flaherty says. "By identifying groups of customers who weren't being served at all or weren't being served enough and being able to fulfill orders quickly and accurately, there's real status to be gained."

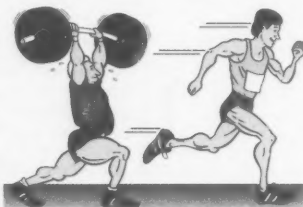
Gary Kirkham, a former IS manager and now executive director at Forecasting Planning Associates, a Dallas-based consulting firm, has also noted this trend toward performance-

based evaluation and reward systems.

"IS performance is more and more based on measurement, a defined objective of what can be measured and the department's ability to meet or come close to measuring up to that goal," Kirkham says.

In some cases, measurements are calculated on the basis of comparative benchmarks.

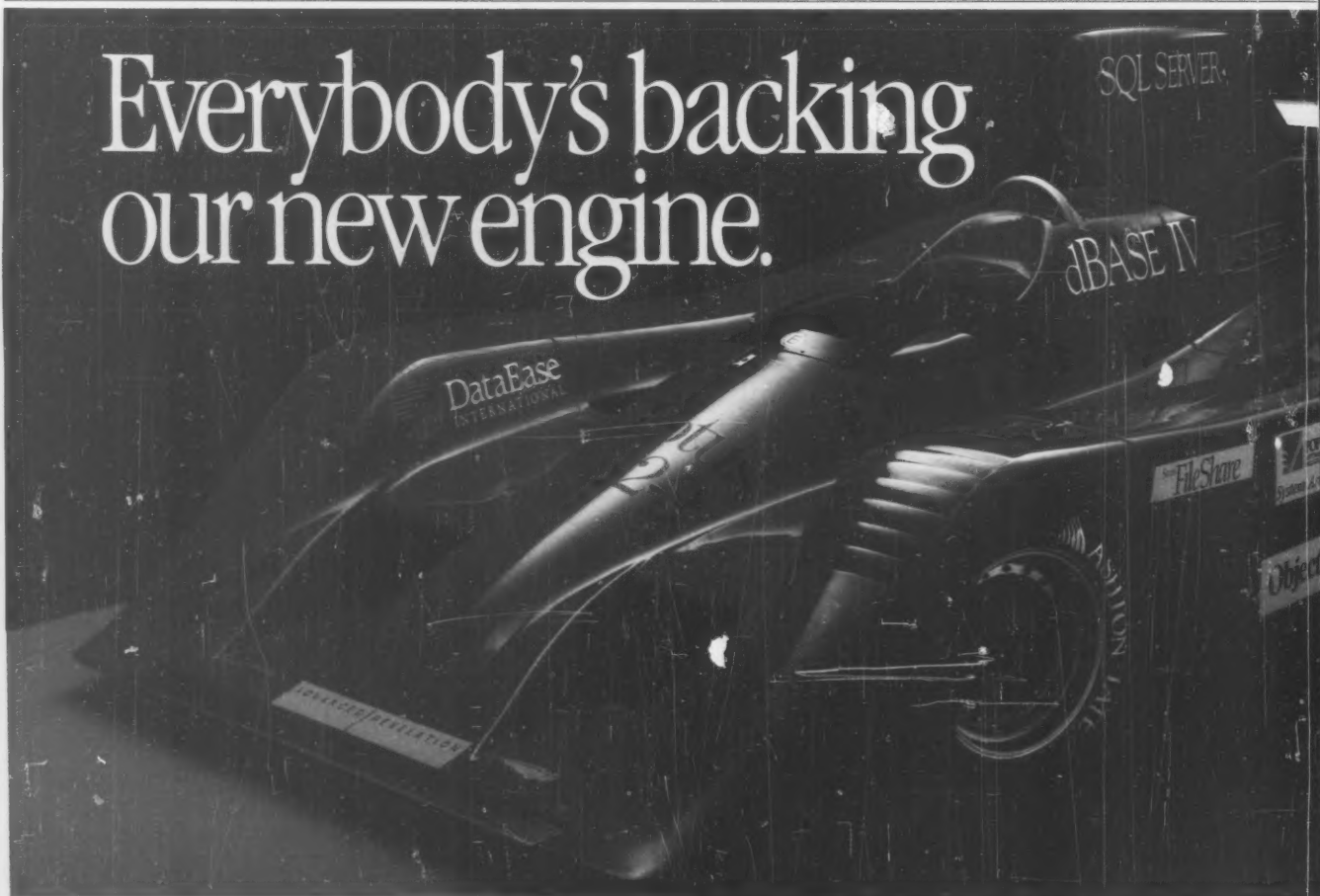
For example, an IS director for an insurance group is "mea-



sured on the ability to meet or exceed the industry average in several categories, including information processing as a percent of general expense by line of business," Kirkham explains.

Downsizing and reorganization often result in the relocation of both applications and personnel within business divisions. When that happens, the ensuing role adjustment can prove

# Everybody's backing our new engine.





to be particularly difficult.

Gary Savarese, a project manager in corporate IS at Kodak Information Systems, a division of Eastman Kodak Co. in Rochester, N.Y., sees opportunity behind the challenge. Savarese is involved with Kodak's soon-to-be-launched pilot downsizing project, which will test the viability of moving payroll and personnel applications out from a centralized IS function to a local PC LAN environment run by Kodak's respective business units [CW, June 12].

This endeavor, he says, will have a direct impact on the future functions, status and job descriptions of Kodak's IS people in the future.

"The focus of how we see IS will be different from what has been in the past," Savarese explains. "IS people will really be managing the implementation of a deliverable product—that is, a purchased software package from a vendor—rather than actually doing the development themselves. With downsizing,

what you're trying to do is get people away from rote technology programming into business analysis."

In the Kodak pilot project, for example, IS staff will form strategic partnerships with software vendors to help adapt a vendor's human resources package directly to the needs of the company. In this capacity, IS personnel could expand their current duties and skills. "Our people would actually be working at higher levels than they are today," Savarese says.

Granted, centralized Kodak IS staff might eventually be reduced if the project is successful, because support of a mainframe-based payroll system would no longer be needed. "But we are not demoralizing our people by doing that," Savarese asserts. "What we are really offering our employees is a new challenge, a new architecture and a new way of thinking." ●

Emmett is a free-lance writer based in Hewitt, N.J.



Cox Cable's Prater says "big-shop" thinking dies hard

## Gibson

FROM PAGE 77

customer effectiveness and also reduce their staff in the field. They increased the investment in information services and built up a highly trained, competent group of 24-hour-a-day operators in Hartford.

**Are you saying it is a mistake to think that, even if businesses are becoming more decentralized, the IS resource has to?**

That's the point exactly. I think it has got to be questioned. That is not to say it will be the opposite, by any means, but it certainly isn't true that IS has to have exactly the same structure as the business.

I think there was a time when that was the case—when IS had to be structured somewhat the same way as the business in terms of the concentration of resources.

But today, particularly with the capabilities of communications and networking technology, it is possible to support a very autonomous set of operating units with a central information resource.

**Assuming that a company**

**does decide that downsizing its systems is appropriate, what would you say are the major management challenges for IS?**

If I think of downsizing as the dispersal of systems and a trend toward an architecture that enables applications to be more easily developed and modified, the implications for users and IS are very profound.

Probably the most important change is that the users have got to learn how to manage the hygiene of effective systems development and maintenance. Important applications absolutely require a level of documentation, clarity and security far beyond what personal computing required in the past. That is a considerable change for most users, who have perceived of accessible technology mostly as something to help them in a personal and individual way.

A second thing, and related to that, is that IS must accompany the downsizing of software with an outreach partnership—a consultative relationship with the users. It won't be enough to simply act as order-takers. Again, this is an old theme, but one that really becomes imperative as the user gains the access and power that is suggested by downsizing.

**It's the attitudinal change that is really the tricky part, isn't it? There really is almost a necessity to stop thinking of yourself as an expert.**

That's right. After years of being asked to provide your expertise, you are now more of a support for people learning to do it on their own. It is like 10 years of driving your kids around, and then seeing them drive. Standing back and watching is very hard. What makes it even harder is the fact that you may still be held responsible if they get in an accident.

Despite all the talk about the dispersal of IS and infusing the organization with technology, top management in most companies still holds the IS function responsible for expenditures and effective use of technology.

**So you cannot stand back too far.**

You aren't allowed to. You're still responsible, especially for the cost side of it. It is a dilemma; really the only thing that will solve it is if IS, top executives and business managers work together to achieve a better understanding and come up with new mechanisms for planning, monitoring and measuring how we use information resources. ●

One look under the hood and you'll see why so many companies are backing the new SQL Server database engine from Ashton-Tate® and Microsoft.\*

By off-loading back end processing to a 286 or 386-based server, it virtually turbo-charges every PC on your LAN. Providing you with every bit of the performance, data integrity and security you've come to expect from expensive mainframe and minicomputers.

So now you can develop a whole new generation of breakthrough applications, and still leverage your current investment in PC hardware.

SQL Server has already established an impressive track record. Key MIS departments are already using it. And major software developers will soon bring you front-end tools to access it.

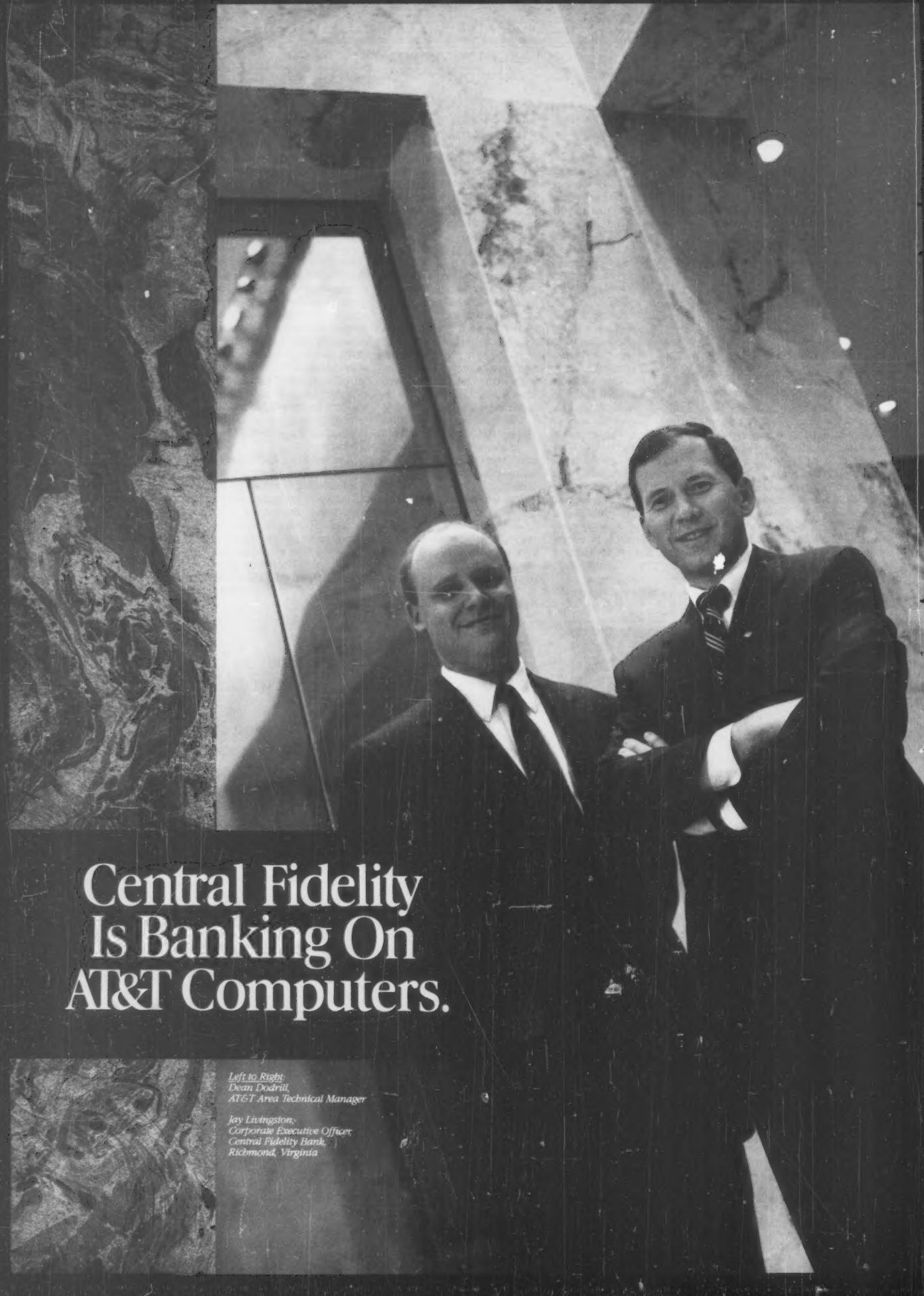
So maybe you should get behind the wheel too. Call Ashton-Tate at 800-437-4329, Ext. 3700\* for a complete set of technical specifications.

And we'll put you on the fast track today.



**ASHTON-TATE®**

\*In Colorado call 303-799-4900, Ext. 5700. Trademarks/Owner: Ashton-Tate, Ashton-Tate Logo/Ashton-Tate Corp.; Microsoft, Microsoft Logo/Microsoft Corp. Other product names or trademarks shown herein are for illustrative purposes only and may be the property of other companies. © 1989 Ashton-Tate Corp.



# Central Fidelity Is Banking On AT&T Computers.

*Left to Right:  
Dean Dodrill,  
AT&T Area Technical Manager*

*Jay Livingston,  
Corporate Executive Officer,  
Central Fidelity Bank,  
Richmond, Virginia*

Richmond, Virginia  
February 2, 1989

Central Fidelity Bank is among the nation's top 100 commercial banks with \$4.8 billion in assets. Looking to extend its fourteen-year record earnings streak, the bank commissioned its data processing division to deliver a vital strategic initiative, improve productivity, enhance sales opportunities, and provide faster customer service in the bank's nearly two hundred branch offices. Jay Livingston met recently with Dean Dodrill of AT&T to review their work together.

**Jay:** Service is what bank customers expect. Faster service improves customer satisfaction and leads to more profitable relationships. When you speed up service, everyone is more productive, and we can spend more time with customers selling the bank's financial products.

**Dean:** Service and selling both depend on information. Our challenge was to provide the branches with rapid access to customer information and present that information to branch personnel in the most meaningful way. This could only be accomplished with a distributed, networked computing approach.

**Jay:** That's right. Our first priority was service and sales support in our branches, which meant fast, accurate retrieval and dispersal of information was crucial. AT&T's banking architecture provided that.

**Dean:** Early on, you talked about cost-effectiveness, return on investment, and a strategy for future growth and functionality. Remember that?

**Jay:** With an emphasis on profitability. We had major investments in existing systems and a lot of branches. AT&T's open systems approach didn't require trade-offs or expensive host additions, which is one of the reasons

you got the business. AT&T's creative alternatives surprised us.

**Dean:** The ease of networking AT&T WGS computers was fundamental to our proposal. We delivered maximum functionality, flexibility, and reliability to every workstation in each branch.

**Jay:** And StarLAN was a terrific way to connect and share branch resources. You made the most of our assets, including the intangible ones.

**Dean:** Like your customer databases—we found ways to further develop relationships with existing customers. The applications development tools we built saved time for your developers. New products and services can now be added quickly to both platform and teller software, so service and sales can continually improve.

**Jay:** Every bank employee associated with this system has become more productive. In my twenty-three years of banking, I've never seen a vendor provide such high-quality service and support. Central Fidelity Bank and AT&T are well positioned for the future.

## The Central Fidelity Computer Solution:

### THE CHALLENGE

Build a distributed, networked computing solution that would improve productivity, customer service, and sales.

### THE RESPONSE

The AT&T Retail Banking Solution. An integrated systems solution that provides effective bank branch platform and teller automation. Supported by AT&T Work-Group Systems, AT&T StarLAN, and software provided by Online Financial Communications Systems, Inc. And AT&T Application Foundation developed by AT&T Bell Laboratories provides a highly productive software customization environment.

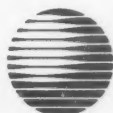
### THE RESULTS

Better customer service. Expanded sales opportunities. Higher productivity.

To learn more, contact your AT&T Account Executive, or call 1 800 247-1212, Ext. 533.

Your Computing Systems  
And Networking  
Solutions Company

© 1989 AT&T



**AT&T**  
The right choice.



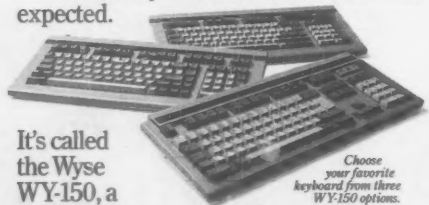


# The Terminal Of The '90s Has Arrived A Bit Early.

## Wyse introduces the WY-150.

They always said there would be such a terminal "someday". It would have the flexibility and connectivity to operate in virtually any computing environment, while meeting the most exacting ergonomic requirements. And, it would deliver those advantages at an affordable price.

"Someday" is here much sooner than expected.



It's called the Wyse WY-150, a breakthrough in terminal technology that will set price/performance standards for years to come.

Choose  
your favorite  
keyboard from three  
WY-150 options.

Bridging the worlds of ASCII, ANSI and PCs, the WY-150 offers compatibility with a wide range of operating systems. Including UNIX/XENIX, MS-DOS, Concurrent DOS, PC-MOS, and PICK. With a choice of three keyboards. And typical of Wyse, the WY-150 does it all with stylish design at a price that's also attractive.

The WY-150 also sets new ergonomic standards. Its 78 Hz refresh rate eliminates any hint of flicker. Just as overscanning and a bezel that matches the soft, paper white phosphor erase distracting borders. (Amber and green phosphors are also available.) The oversize 10x16 cell makes each crisp character stand out vividly.

The WY-150 is also part of *SystemWyse*. It links effortlessly with Wyse PCs and multi-user platforms to create uniquely

integrated and cost-effective solutions. Everything is designed, manufactured, and tested by Wyse to work together. And it's all backed by the service and support of the world's leading independent terminal maker.\*

Only one question remains. Now that the terminal of the '90s is here, what are you waiting for? Call today for more information on the WY-150.

## 1-800-GET-WYSE

Wyse® is a registered trademark of Wyse Technology. SystemWyse and WY-150 are trademarks of Wyse Technology. Other trademarks/owners: UNIX/American Telephone & Telegraph; Concurrent DOS/Digital Research Inc.; PC-MOS/The Software Link, Inc.; PICK/Pick Systems; MS-DOS, XENIX/Microsoft. \*IDC 1988 U.S. Terminal Census.

# WYSE

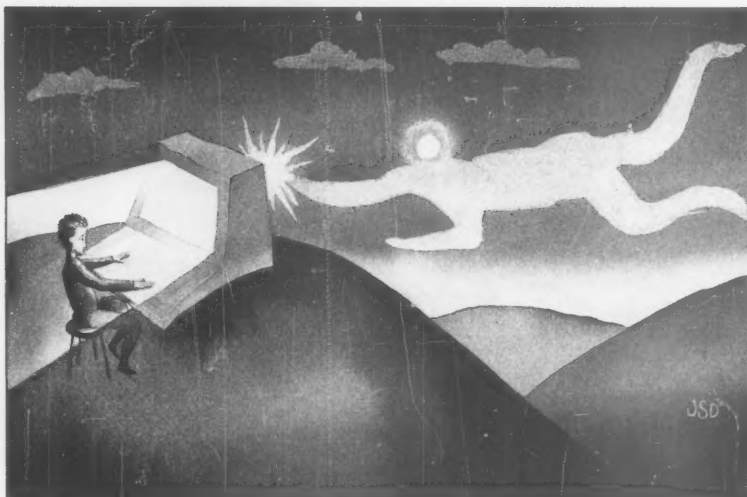
We make it better, or we just don't make it.



# IN DEPTH

## Optical computing

*Switching the light fantastic, but not with electronics*



JOHN DYKES

BY LEE GRUENFELD

**A**s systems software overhead increases, as demand for computing power grows and as important scientific problems become more and more computationally intractable, one thing is clear: Computers need to get faster.

Current technology, however, is approaching theoretical limits. Although parallel architectures hold real promise for huge leaps in throughput power, they are cumbersome to implement electronically. Thus, increasing speed at the component level will always be a chief concern.

One idea receiving serious attention is to use light instead of electricity throughout all parts of the computer. Computing directly with photons rather than electrons is a giant leap beyond

just compact disk/read-only memory (CD-ROM) or fiber optics, which are the current incarnations of light-based, or "photonic," technology. According to a recent Frost & Sullivan, Inc. report, optical components will represent a \$150 million to \$200 million market by 1990 and will dominate the next generation of computing in some key areas.

Indeed, just as we were getting used to such basic computing components as transistors, very large-scale integration circuits and gallium arsenide, we may soon find ourselves speaking of diffraction gratings, holograms and polarizers as well as transphasors, a sort of optical transistor with potential switching speeds in the picoseconds, or one trillionth of a second (see chart next page).

The most obvious advantage of photonics is speed. Light is faster than electricity. Electric-

ity in a chip travels about 500 times slower than light in a fiber and 150 times slower than light in an optical integrated circuit.

### Computing bottleneck

While much recent attention has focused on increasing switching speeds, this becomes progressively less relevant as moving the results of the switching operation from place to place becomes the primary computing bottleneck. That is one of the reasons a Cray Research, Inc. supercomputer is circular: It minimizes the distances that signals need to travel as well as the associated propagation lag.

This is not to downplay the potential of optical switches. Their speeds can match those of Josephson junctions, but they operate in much more reasonable environments because the junctions require cryogenic operating conditions, whereas photon-

ics work at room temperature.

Whatever the switching technology, optical computers can be made smaller, lighter and simpler, all of which add up to cheaper.

While electronic pathways must be carefully spaced to avoid interference, photons have no charge and thus generate no fields as they move. No matter how close together they are, photons do not interact with one another and can even cross paths with no effect. Connections into the middle of optical chips can be made directly without the need to go through a cumbersome peripheral pin arrangement, enabling further decreases in size.

Photonics are also immune to outside interference. While electronics can get hit with everything from cosmic rays to the pulse generated by an atomic weapon, photons do not react to radiation.

Finally, optical computers can compute directly without the need to first transform the images via sampling, digitization and so on. However, this last advantage may not always be available, especially in the first several generations of optical computers. This is because there are two basic types of optical computers — those that are pure analog machines and those that use some form of digital encoding.

Analog computers are more suited to directly exploiting the unique advantages offered by

Gruenfeld, a management consulting partner in the Los Angeles office of Touche Ross & Co., specializes in strategic IS planning and the application of advanced technology. He would like to acknowledge the input of Dror Feitelson of the Hebrew University of Jerusalem, who wrote *Optical Computing: A Survey for Computer Scientists* (MIT Press, 1988).

- Built smaller, lighter and simpler
- Exploiting the wave properties of light
- Of holograms, polarizers and transphasors

# A "smart" generator = database, language and hardware independence.

Introducing the world's first "smart" generator — Cullinet's Enterprise:Generator™. It's "smart" because it allows you to generate and run applications on the database and platform of your choice, independent of hardware, operating system or programming language. In fact, only Enterprise:Generator can generate code in Cobol, C, BASIC, ADS/OnLine and Fortran with a 30:1 productivity advantage.

It will change your company's programming power forever.

So don't wait. Act

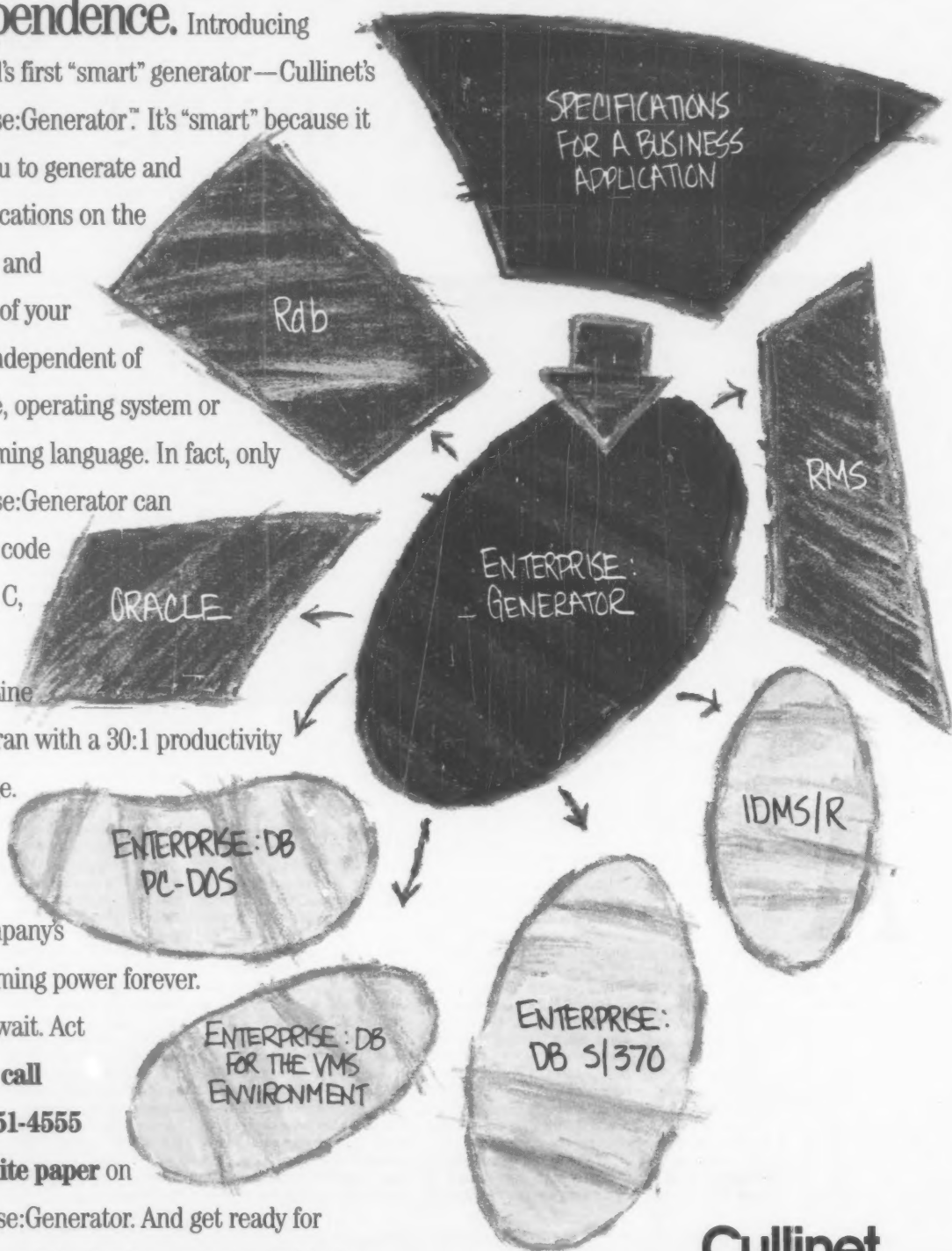
now and **call**

**1-800-551-4555**

**for a white paper on**

Enterprise:Generator. And get ready for breakthrough technology you can add today.

And build on. And on. And on.



**Cullinet**  
The Power To Build On.

**digital** Computing  
Marketing  
Programs

Enterprise:Generator, Enterprise:DB, ADS/OnLine and IDMS/R are trademarks of Cullinet Software, Inc. System 370 and PC-DOS are trademarks of International Business Machines. Oracle is a trademark of Oracle Corporation. Rdb, RMS and VMS are trademarks of Digital Equipment Corporation. ©1986, Cullinet Software, Inc.

## See Enterprise:Generator at the Cullinet Seminar nearest you.

Attend this new Cullinet seminar, and in just two hours, you'll see for yourself how easily you can generate code for production applications on VAX™ or MVS with Enterprise:Generator. It's a small investment in time that will change your company's programming power forever. So don't miss out. Call us toll free, and make your reservation today.

### Call 1-800-551-4555 for your reservation.

(In MA, 617-329-7700, Ext. 2135.)

### Enterprise:Generator Seminars For The MVS Environment

San Francisco, CA	6/21
Los Angeles, CA	6/28
San Diego, CA	6/29
Los Angeles, CA	7/12

### Enterprise:Generator Seminars For The VAX Environment

Philadelphia, PA	6/20
Minneapolis, MN	6/20
Oakland, CA	6/20
Cleveland, OH	6/20
Ottawa, ONT	6/21
Miami, FL	6/21
New York, NY	6/21
Chicago, IL	6/22
Hartford, CT	6/22
Denver, CO	6/27
Cincinnati, OH	6/27
Dallas, TX	6/27
Detroit, MI	6/29
Valley, CA	7/11
Toronto, ONT	7/12
Houston, TX	7/13
Pittsburgh, PA	7/13
Milwaukee, WI	7/13
Atlanta, GA	7/18
Long Island, NY	7/18
Montreal, QUE	7/19
Indianapolis, IN	7/19
Charlotte, NC	7/20
Boston, MA	7/20
Washington, DC	7/20
Washington, DC	8/24

# Cullinet.

The Power To Build On.

photonics, but they are limited in precision to the equivalent of about eight bits. The need for much greater accuracy in most applications requires digitization, which offers greater precision in exchange for some additional transformations but a resultant reduction in performance. The argument in favor of digitization is also bolstered by the enormous amount of experience we have in building and manipulating such systems.

#### How will it work?

As currently contemplated, optical computers primarily exploit the wave rather than particle properties of light, although this is more relevant for the analog than the digital machines. The parts that will make up the optical computer have few parallels in current technology, although their more macro manifestations in such computing elements as memory and storage do.

In optical computing, mirrors and prisms will be used to redirect beams to the right place. Beams will be computationally manipulated by such devices as beam splitters, lenses and spatial light modulators. The latter, an important feature of optical computing, is the analog equivalent of the digital electronic black box that performs a known set of transformations on input to produce predictable output. Polarizers essentially assign to the light beam one of two binary characteristics that can later be "read" by analyzers.

Switching, which is likely to always be needed somewhere in any computer, is accomplished by what are called optically bistable devices having three special characteristics:

- **Bistability**, which describes the device transitions between two discrete output intensities, providing a clear distinction between zero and one, yes and no and on and off.

- **Nonlinearity**, which refers to the fact

that as the energy level to the device increases or decreases, the change in output state is sudden at some threshold so there is no ambiguity about its state.

- **Hysteresis**, which means that the threshold on the way up is higher than on the way down. In other words, the device stays put unless something tries hard to change it — this, of course, constitutes memory.

How would such higher level computing components as memory, interconnections, storage, logic and architectures look in the optical computer? It is not entirely clear that short-term memory is

gle-bit memories that can be both written to (set in one of two states) and read (determine which state the bit is in).

Another way to build such an optical flip-flop is by using liquid crystal light valves (LCLV), which is how the readout on a digital watch is made. Light shines through a polarizer, hits the LCLV and is then reflected back out through the polarizer. If a voltage is applied to the LCLV, the polarization of the incoming beam is rotated so that it is perpendicular to the polarizer, and it cannot make it back out — it looks black. This is how visible digits are produced on digital displays.

But interconnectivity is where photonics really shine. Not only is light faster than electricity, but the usable bandwidth is enormous. Bandwidth is a function of the modulation frequency, which is in turn dependent on the frequency — or color — of the optical carrier. Modulation frequencies of one trillion hertz have already been demonstrated and could theoretically go to 100 trillion hertz.

Beams of light do not need to be guided by fiber optics within the controlled confines of an optical computer. Beams carrying data can be shot out across empty spaces with no danger of cross talk among beams. Not only can the interconnect densities be tremendous, but connecting across free space will allow light to travel at full speed, because

the fastest way to get an electromagnetic signal from one place to another is to let it go on its own. Multiple signals can even be sent on identical paths if they are encoded at different frequencies, but thus far it appears that this is not considered a practical construct.

Mass storage is considered to be one of the most fascinating areas in optical computing. The future method of optical storage will be via holography.

The idea is to arrange data into pages, Continued on page 88

## What is optical computing up against?

A comparison of alternative technologies for building computers

Technology	Advantages	Disadvantages
<b>Silicon</b>	Low price, reliable, not sensitive to variations in manufacture and environment, ease of integration and materials	Limited switching speed, packing density and interconnection speed
<b>GaAs<sup>1</sup></b>	Very high speed with simple production steps	Sensitive to variations in production, VLSI <sup>2</sup> doubtful
<b>Tunnel diodes</b>	High speed	Unsymmetrical switching, sensitive to variations
<b>Josephson devices</b>	Low power consumption, high packing density, high speed	No gain, cryogenic operating conditions
<b>Optical bistability</b>	High interconnection density, high speed, inherently suitable for parallelism	Sensitive to variations, vibrations and temperature; fabrication technology uncertain

<sup>1</sup> Gallium arsenide

<sup>2</sup> Very large-scale integration

SOURCE: OPTICAL COMPUTING: A SURVEY FOR COMPUTER SCIENTISTS BY DROR G. FEITELSON, REPRINTED WITH PERMISSION OF THE MIT PRESS, CAMBRIDGE, MASS., ©1988 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

even needed in optical computing. Why? In a data-flow architecture, individual operations are performed by individual processing modules, and the output is sent immediately to other modules that need the data. Thus, there is no need to store interim results anywhere.

However, given the likelihood that early-generation optical computers will mimic the von Neumann architecture, memory is a topic worth exploring. Optically bistable devices can play a part in memory because they are essentially sin-

## The state of the art

**W**hat is state of the art in optical computing? There is already a good deal of component work under way, but it is primarily for hybrid technologies. It seems that the von Neumann architecture is here to stay; the investment is so great that optical computers will need to mimic it.

Optically bistable devices are already running in the labs. At AT&T, self-electro-optic effect devices (SEED), consisting of multiple quantum wells formed by hundreds of alternating layers of gallium arsenide and aluminum gallium arsenide, have already been fabricated into working arrays. SEEDs are good optical logic gates because of their small size, low power needs and high switching speeds.

The forbidding-sounding quantum well envelope state transition (QWEST) device has an interesting side benefit in that it will work in temperature ranges between that of liquid nitrogen (-196°C) and boiling water (100°C). This enormous operating spectrum makes QWEST ideal for applications in hostile environments.

NEC Corp. recently succeeded in demonstrating a 1K-bit optical integrated circuit containing 1,000 optical elements working together to perform light sending and receiving, memory and logic functions. This apparently was not part of

NEC's new supercomputing announcement. Out on the frontier, British Telecom is making advances in the use of solitons, which are ultrashort, isolated light pulses, to switch optically encoded information. Unlike normal light, laser-generated solitons travel thousands of kilometers without repeaters and without losing strength or shape.

While most of the current research is focusing on architectures analogous to traditional electronic processors, Alan Huang and his colleagues at AT&T Bell Laboratories in Holmdel, N.J., are trying hard to take advantage of the unique properties of optical computers to expand the boundaries of computing theory. Using such exotic techniques as symbolic substitution and "computational origami," Huang's team is pushing computing to levels not possible with conventional electronics.

Further, as a National Research Council report warned last September, the Japanese are ahead in component fabrication because of their experience in such electronic devices as compact disk players. However, the U.S. also has a lot to offer in this area. Because of optical computers' resistance to interference, the U.S. military is interested in this technology. Thus, much of the interesting work is classified.

LEE GRUENFELD



# WHAT MOST PRINTERS LOOK LIKE TO A MULTIPART FORM.

If your printer turns forms printing into a feeding frenzy, give it the heave-ho, and pick up a Datasouth instead.

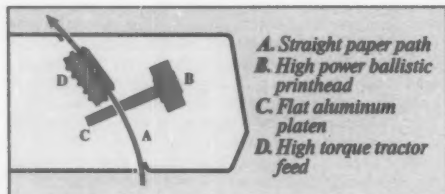
Datasouth printers are designed specifically for printing thick, hard-to-manage forms, without ripping and tearing them to pieces.

All Datasouth printers have a straight paper path, so stiff multipart

forms feed through smoothly. No jamming, wrinkling, or crumpling.

Every model comes equipped with a high power ballistic printhead with enough bite to print legibly through six copies. A Datasouth is built for 100% duty cycles, even in the most demanding applications. And with speeds up to 400 cps, a Datasouth won't eat into your productivity.

Datasouth has printers that are plug-compatible with almost any equipment.



ASCII minis and micros. DEC VAX systems. And IBM System/3X, AS/400, and 3270-type systems.

There are even Demand Document models with a zero tear-off feature. So you can print to the bottom of your document and tear it off without wrecking the form that follows.

So let your old printer bite the dust. And sink your teeth into a Datasouth. Call toll free for the name of your nearest distributor.

**1-800  
222  
4528**



**Datasouth**  
AMERICA'S HIGH PERFORMANCE  
PRINTER COMPANY

P.O. Box 240947, Charlotte, NC 28224 • (704) 523-8500 • Tlx 6843018, DASO UW • Sales: 1 (800) 222-4528 • Service: 1 (800) 438-5050 • West Coast Office: (213) 649-5669

VAX and DEC are registered trademarks of Digital Equipment Corporation. IBM is a registered trademark of International Business Machines Corporation.



# How do they compute?

Photonic computation, especially in the low-precision analog mode, is vastly different from electronic computing. It is much more direct, as shown in several examples:

• **Addition.** To add two numbers represented by two coherent beams, such as those produced by a laser, they are simply combined using a half-mirror and sent to a detector that directly measures the resultant combined amplitudes. If the beams

are incoherent, the intensities are summed.

• **Subtraction.** The most interesting subtraction method using coherent light is to shine one value beam onto a special electro-optical spatial light modulator that generates a charge throughout its crystalline structure corresponding to the characteristics or value of the beam. By reversing the voltage and shining the second beam onto the crystal, the resulting charge represents the difference between the two beam values.

• **Multiplication and division.** Multiplication is the easiest calculation of all in optical computing. When coherent light is passed through a transparency, its amplitude is multiplied as a function of the transmittance of that transparency. All

that is required here is to pass a beam through two transparencies representing the values to be multiplied. These can be generated on the fly by using photochromatic materials.

Division can always be expressed as two multiplications and can therefore be accomplished with three transparencies.

• **Matrix manipulations.** These are the most interesting because they can often be accomplished directly in a fully parallel operation. Take vector-matrix multiplication as an example.

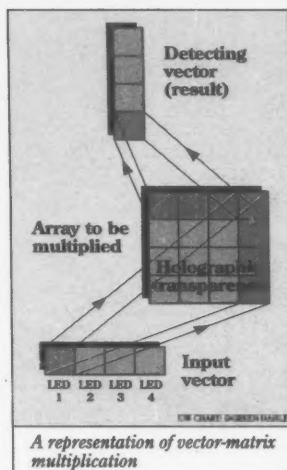
Suppose we wish to multiply a four-by-four array by a vector of four elements (see figure below). The vector is represented by four LEDs, of which the intensities are proportional to each of the four represented values. The array is a trans-

parency in which 16 elements have a transmittance proportional to the values represented.

A special astigmatic lens distributes the light from the vector LEDs onto the columns of the holographic transparency matrix. Another lens collects the light from each row of the matrix and focuses it onto the corresponding detector. The intensities, or brightness readings, detected in this final stage represent the multiplication of the vector by the matrix.

The entire operation happens in parallel, regardless of the number of vector or matrix elements. A recent demonstration of a multiplication of a 100-element vector by a 100-by 100-unit matrix was accomplished in about 20 nanoseconds.

LEE GRUENFELD



## Smooth Conversion

Changing mainframes, programming languages or operating systems? Don't let a do-it-yourself conversion make life rough for you. Call the Smooth Conversion specialists at CTG/Dataware.

With hundreds of successful conversions for companies like yours, we have the tools, the expertise and the experience to keep your conversion on time, on target and on budget.

For a Smooth Conversion, call toll-free

**1-800-367-2687**

**CTG/DATAWARE**

COMPUTER TASK GROUP INC.  
DATAWARE CONVERSION SERVICES

3095 Union Road, Orchard Park, New York 14127-1214  
(716) 674-9310 TELEX: 510-100-2155



## The New Tandy® 4000 SX

386™ performance at a price you'd expect of a 286 system.

A price/performance breakthrough for 386-based systems, the new Tandy 4000 SX combines more integrated features than ever before in a machine at this price.

The Intel 80386SX microprocessor combines the ability to operate high-performance 80386 based software, as well as current 80286 and 8088 based software. You get the combination of 32-bit performance with 16-bit hardware compatibility.

This means the Tandy 4000 SX insures your computer investment for the future. As a

low-cost alternative to an expensive 386 system, you won't be left behind when you want to move on to more advanced 386 based applications, like MS® OS/2.

Built-in VGA graphics give you beautifully detailed, high-resolution displays. Add a color analog monitor and create astonishing graphics using a palette of 256,000 colors for near-photographic clarity.

The 4000 SX's SmartDrive™ Integrated Drive Electronics (IDE) technology allows you to add high-performance hard

disk drives without the need or expense of installing a separate disk controller.

The new Tandy 4000 SX. From the best-selling family of PC Compatibles in America.

Send me a Tandy 4000 SX brochure.

Mail to: Radio Shack, Dept. 88-A-782  
300 One Tandy Center, Fort Worth, TX 76102

Name

Company

Address

City  State

ZIP  Phone

**Tandy Computers: Because there is no better value.™**

SmartDrive™/TM Tandy Corp. Intel and 386™/TM licensed from Intel Corp.  
MS/ licensed from Microsoft Corp.

**Radio Shack**  
COMPUTER CENTERS  
A DIVISION OF TANDY CORPORATION

**From page 85**

which are quite literally arrays of light and dark pixels representing ones and zeros, and project these holographically onto an emulsion. One thin-film hologram can store about 100 million bits of information. This in itself may not be hugely impressive, but there is a twist.

In a thicker holographic emulsion, it turns out that there is extreme sensitivity to the direction of the reference beam used to record the image. A very slight change in the beam will totally redistribute the image throughout the thick film, without interfering in any way with other images stored in the same volume. An exact duplicate of the beam will retrieve the image. Thus, you can use a thick-film hologram to store multiple images, as long as you avoid the degradation caused by storing too many images. Assuming that we can differentiate only 1,000 such beams, a single volume could still hold 125G bytes.

There are two more features of holographic mass storage worth mentioning. First, data can be retrieved an entire page at a time, so effective data transfer rates of 1G bit/sec. are not inconceivable. Second, holograms are inherently redundant, so any subset of the overall image contains the whole picture. The result is a high tolerance for noise and a built-in ability to reconstruct all the data from segments surviving a catastrophe.

The Microelectronics and Computer Technology Corp. research consortium based in Austin, Texas, is now showing its members a photorefractive volume holographic storage system. It holds 1G byte of data in an array of crystalline fibers, with access times three times faster than magnetic disks and a nondestructive read capability.

**Logic devices**

In optical computing, there is no inherent need to limit logic to two states, as is required in a binary system, and computational methodologies have already been proposed for higher order machines. Again, however, assuming that the initial incarnation of general-purpose optical computers will follow well-established principles, consider the element of binary logic.

There are three basic methods of representing discrete states. The first is called "bright true" logic, in which a "one" is represented by high intensity and a "zero" by low intensity. The inverse is "dark true," in which a "one" is low intensity. The second is orthogonal polarization, in which the polarization direction represents one of two states. Compared with the intensity method, orthogonal polarization has an advantage in that changing states requires virtually no investment of energy. In bright true logic, the whole sig-

nal is lost and must be regenerated. The third method is spatial location in which the location of a spot of light indicates the value. Like orthogonal polarization, changing states does not change energy.

An example of basic logic handling is truth-table. In an optical device, table entries can be holographically encoded, with each input line superimposed on each

table entry. The output is in the form of light and dark results at fixed pixel positions. However, unlike in an electronic serial processor, the entire evaluation is performed in one operation and is simply a matter of the light shining through the right components and hitting a detector. Many radically new computing architectures are possible, but general-purpose, all-optical

computers are expected to be single-instruction-stream multiple-data-stream machines, which means they should perform identical operations on many data streams in parallel.

**Optical architectures**

The most obvious near-term optical computing architecture is a hybrid one, in which optical components are substituted for elec-

tronic ones without necessarily changing the basic configuration. This is currently typified by the use of fiber-optic cables for transmission and CD-ROM for storage. Examples currently under development include optical interconnectors (see story page 85).

Other architectural possibilities include pipelined data flow. It was developed as a response to



## Choose this,

Everyone's computing needs are unique. Which is why different people choose different solutions. And why so many diverse computing environments are being used today.

While this variety of solutions makes it easy for users to meet their needs, it presents some problems. Like sharing information between incompatible systems. The kinds of problems facing more and more companies as their information systems grow and diversify.

**Novell means freedom.** Fortunately,

you can solve those problems by making one simple choice: Novell. Novell's NetWare® operating system software supports a myriad of computing environments.

That means you have the freedom to network everything from PCs to Macintosh, VAX to PS/2, 386 to mainframe host systems. So everyone can use the workstations they choose, without changing the way they work.

**The power to choose.** With NetWare, Novell gives you the most powerful combination of network performance, security,

© 1988 Novell Inc., World Headquarters, 122 East 1700 South, Provo, Utah 84601 (801)379-5900

the computing problem known as the von Neumann bottleneck, which occurs when an electronic computer spends most of its time finding out where data is or where it belongs and then getting it or putting it somewhere instead of doing something useful with it. To make matters worse, the majority of memory is idle while this search is going on.

In typical data flow, numer-

ous modules carry out operations on their own and communicate with whatever other modules they need to. The biggest obstacle to building data-flow machines is the difficulty of interconnection. Optical architectures may be able to overcome this limitation by "pipelining," which sets up a purposeful constraint on the data-flow architecture whereby modules are ar-

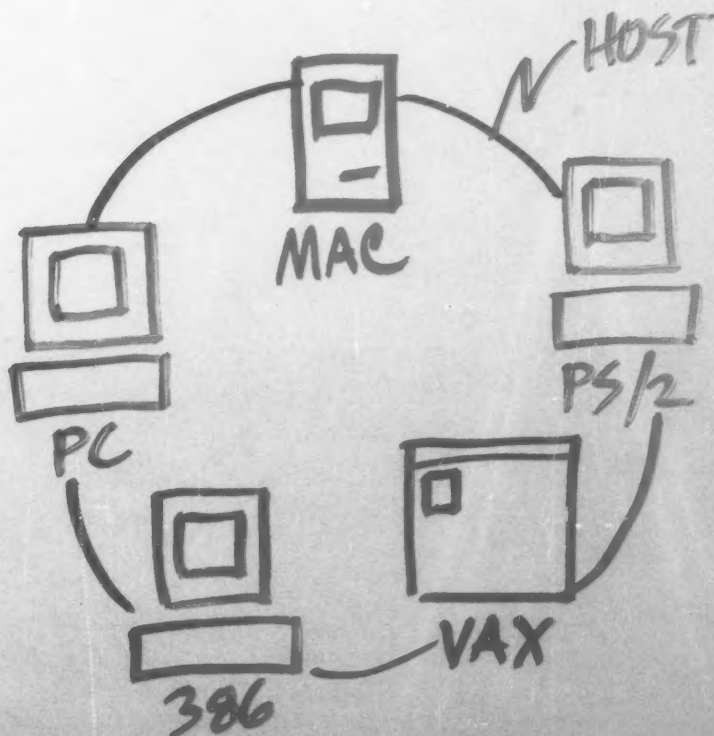
ranged into serial stages through which parallel data streams are pumped.

Another optical architectural candidate is the true neural network. This type of computer is a cornerstone of artificial intelligence, as it deals with such tasks as pattern recognition and other problems that cannot be easily solved by strictly algorithmic devices. Like the data-flow archi-

ture, current neural network machines are highly constrained by the severely limited number of possible physical interconnections among processing elements. Simulating physical interconnections via conventional addressing is so limiting as to preclude the more advanced benefits of neural computing.

By exploiting the enormous interconnect potential of an opti-

cal computer, a special-purpose, neuro-optical computer can be built that is inherently optimized for this type of computing. But it will not work well as a general-purpose computer. Demetri Psaltis at the California Institute of Technology in Pasadena has already constructed an optical computer, albeit a highly specialized one, that can categorize images of different types of trees.



#### Optical limitations

The limitations on any switch-based computing device are dependent on the amount of power required to cause a state change vs. the rate at which the heat generated can be carried off. This is called the thermal transfer limit.

In the case of optical devices, it is theoretically possible to achieve switching speeds in the sub-picosecond range, but this falls outside the thermal transfer limit and makes these devices impractical. Having fewer photons would reduce the power requirement, but, at the most practical wavelengths, the wave energy equivalent of at least 1,000 photons needs to work in concert to avoid statistical fluctuations that would lead to switching errors.

Thus, approximately 100 billion switches per second is more realistic, which is roughly equivalent to a Josephson junction. While the Josephson junction consumes less power than the optical device, the enormous practical difficulties weigh in favor of photonics.

It is also important to note that there are some density constraints owing to the minimum cross sections to which the light beams can be confined without disruptive diffraction effects. These should be more than offset by the much larger interconnect densities that are possible.

What is the prognosis for optical computing? Most experts say it is unlikely that we will see an all-optical computer in this century. Since even some optical proponents believe going head-to-head with electronic computers is a losing game, most work is being directed toward opto-electronic hybrids. The nearest term opportunities probably lie in communications, simulations for aerospace design, advanced robotics and such precision pattern recognition tasks as fingerprint identification.

However, there is reason to believe that a simple, working, all-optical computer will come out of either AT&T Bell Laboratories or the Opto-electronic Computer Center in Boulder, Colo., by 1995, with about enough complexity to run a home appliance such as a microwave oven or dishwasher. Success with these types of single-purpose "proof-of-concept" applications will bode well for a general-purpose commercial machine by the year 2000. •

## and you can choose all of these.

functionality and system reliability available. Plus you get the power to transparently connect to any of the more than two million users worldwide who have already chosen NetWare.

And as your computing needs expand, the network will grow with you. Giving greater networking capability and allowing you to connect to new environments.

**The freedom to choose.** Exercise your freedom to choose the desktop environment that best meets your needs. Choose the networking power of NetWare. See your

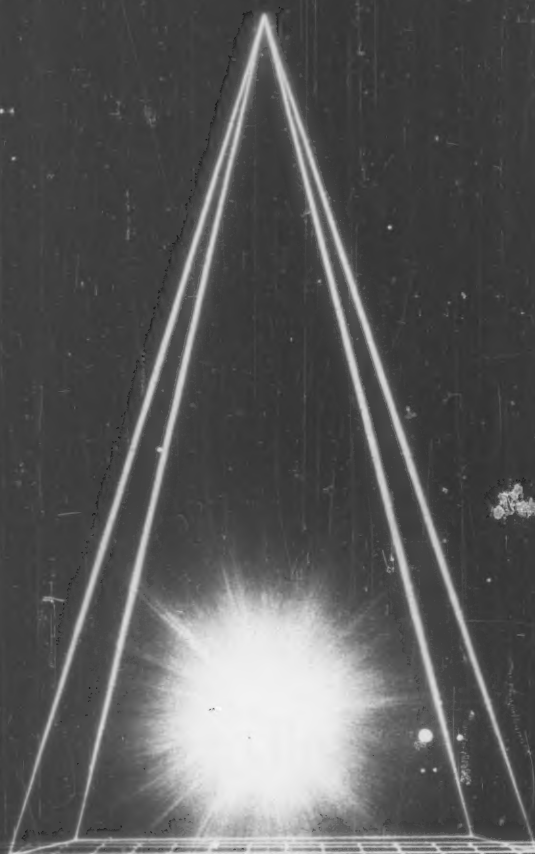
Gold Novell Authorized Reseller, or call 1-800-LANKIND.



For network solutions,  
you should be seeing red.



COMPUTERWORLD'S  
**PREMIER**  
**100**





# Today's IS Technology Leaders. Tomorrow's Biggest Business Successes.

IS for success.

It's the most critical challenge facing companies today. And it's what the second annual *Computerworld Premier 100* is all about. On September 11, this exclusive report will reveal the top 100 companies investing most effectively in computer systems. The leaders destined to be the biggest business successes tomorrow.

But *Computerworld's Premier 100* does far more than list big spenders. Year-long research efforts analyze six important criteria—investment in systems, company financial success, user access to technology, competitive standing, investment in personnel/training, and MIS budget. All to provide the only valid measurement of total information systems effectiveness.

When this glossy, magazine-size supplement hits your desk along with *Computerworld* on September 11, you'll find out who the leading players are—and how they're leveraging IS for success.

This invaluable business tool:

- Ranks the 100 most effective IS technology users—and leaders within key vertical markets.
- Profiles powerful strategies for adding profit to the bottom line.
- Provides snapshots of IS investments in over 15 industry segments.
- Discusses application and staffing trends among the largest users.
- Offers many helpful guidelines for maximizing IS investments.

And if you're an advertiser, here's a unique opportunity to further your success in IS. The *Computerworld Premier 100* will showcase your message to *Computerworld's* influential audience of over 620,000. On September 11 and all year long. Call Val Landi, Senior Vice President/Associate Publisher, at 508-879-0700. Or contact your local *Computerworld* sales representative. And be sure to ask how you can save 20%—and more—on your *Computerworld Premier 100* ad!

---

ISSUE DATE: SEPTEMBER 11  
AD CLOSING DATE: AUGUST 11

## COMPUTERWORLD

---

# Compromise Your Standards And Nobody Else Will Talk To You.



## In The Dial-Up World, Connectivity Is Just As Important As Speed.

Just about every V.32 modem ad you read hypes speed. However, it doesn't matter how fast a modem transmits data, if the one at the other end can't receive it.

If you rely on a modem that uses proprietary modulation schemes, handshaking techniques or data compression classes, you've compromised your connectivity.

Which is why you should choose our DataComm 296B. It's fully compliant with V.32 standards. So it can talk to any other real V.32 modem, synchronously or asynchronously, without any tricks, using universally available data compression techniques.

And if you're really looking for throughput, consider this: our DataComm 296B will sustain in excess of 30,000 bps, full duplex, under real world conditions, using real world data and industry standard MNP\* Class 5.

But, because bits-per-second are not the only measure of throughput, you should consider our Continuously Adaptive Echo Cancellation fea-


ture. It can improve throughput even further by drastically reducing retransmissions. (If you get it right the first time, your throughput will be higher, and your phone charges lower.)

So if you're really serious, don't compromise your standards. Contact us. Our representatives have a whole lot more to talk about. Like Automatic Dial Back-Up, DataCommonality and a nationwide service organization.

Call 1-800-777-4005, General DataComm, Middlebury, CT 06762-1299. Tel.: (203) 574-1118, Telex: 643357, Fax: (203) 758-8507.



**In Data Communications, There's Only One General™**

 **General DataComm**

\*MNP is a trademark of Microcom, Inc.

# COMPUTER INDUSTRY

## INDUSTRY INSIGHT

Jean S. Bozman

### CDC: Forever changed?



I'm looking over a special business card. It's one that I received from a Control Data Corp. manager

a year ago. The thing that seemed prophetic — even eerie — about the card was that the person's name was printed on clear plastic.

The see-through card was printed to advertise CDC's new Transparent Computing Environment.

By using the word "transparent," CDC managers most likely meant to connote an ease of use for end users, who could easily access a Cyber 205 mainframe from their handy desktop Macintosh system. Surely they did not mean to convey a sense of uneasiness about CDC's future presence in the computer industry.

Yet, a year ago, some of  
*Continued on page 96*

#### Inside

- Study forecasts bright future for image technology. Page 94.
- DARPA funding highlights U.S. innovation in high-definition TV. Page 96.

## Is Miniscribe's ship sinking?

BY RICHARD PASTORE  
CW STAFF

Firings and resignations of key Miniscribe Corp. officers earlier this month, including the resignation of President Gerald Goodman, have analysts wondering just how deep the troubled waters run at the Longmont, Colo., disk drive maker. According to one analyst, the firm may sink or swim with its upcoming drive introduction.

Chief Financial Officer William Lorea was among several officers and other employees fired or encouraged to resign on the recommendation of an independent evaluation committee.

The committee was established in March to investigate the company's financial statements and internal controls, as well as class-action suits filed by

investors charging Miniscribe with security law violations.

The committee's findings prompted Miniscribe Chief Executive Officer Richard Rifenburgh to announce in May that the firm's financial statements for the first three quarters of 1988 and fiscal years 1987 and 1986 "should not be relied on."

#### No surprises

In light of this disclosure, analysts said they were not surprised at the recent officer departures. Goodman and Lorea "have been out of the day-to-day operations for quite some time," said David Vellante, an analyst at International Data Corp. in Framingham, Mass. "The company waited a while for some of the dust to settle to announce it." Senior Vice-President Kelly Hickel was elected to replace

Goodman. Lorea, who had been on a leave of absence, was replaced by acting CFO Roger Mason.

"The specific departures that were revealed in no way surprise me," said Harvey Allison, vice-president of research at Wertheim, Schroder & Co. in New York. Allison, however, said that Miniscribe's refusal to release names of the other departing officers has hampered efforts to determine the firm's financial viability.

Vellante, however, did venture that Miniscribe will "probably make it through the year, or at least through the next product introduction." The company will announce a 1-in. high drive for 3½-in. disks for desktop, laptop and portable machines sometime during this summer, he said.

*Continued on page 98*

## Illinois aims for sales tax on software

BY ELLIS BOOKER  
CW STAFF

SPRINGFIELD, Ill. — Legislators here want to close a tax loophole that makes this state one of the last in the U.S. that does not tax sales of prepackaged software programs.

For several years, lawmakers in the Illinois General Assembly have tried to impose the state's sales tax, now 6¼%, on retail software and use the proceeds to fund various capital programs. They have been successfully blocked, however, by business groups concerned that the proposal might expand to cover customized programming work.

However, a spokesman for Democratic House Speaker Michael Madigan, who is spearheading the bill, said the latest proposal has a good chance of passing this round and that the business community's concerns have been addressed. "If you're a programmer doing customized work, this [tax] would not apply," the spokesman said.

The current proposal calls for using the estimated \$24 million in annual revenue from the software sales tax to help fund a construction program at the Chicago Public Library. The Illinois General Assembly also passed a measure making it a Class 4 felony, punishable by up to three years in prison, to inject software viruses into computers. It is now pending before Illinois Governor James Thompson.

## End of an era: Cullinet VP looks back

BY NELL MARGOLIS  
CW STAFF

WESTWOOD, Mass. — It would be an exaggeration to say that Cullinet Software, Inc. marketing Vice-President Jeffrey Papows has seen it all. But it would not be a big one.

Last week, as the ink dried on the papers that sold yesterday's software legend — Cullinet — to today's — Computer Associates International, Inc. (see story page 1) — Papows looked back over the turbulent years since the September 1986 "Blueprint" press announce-

ment that launched the company's massive product line overhaul and market repositioning. Even from this vantage point, he said, it is a dizzying view.

"If you think of the cultural and organizational changes we've gone through in so short a time — acquisitions, divestments, organizational realignment, new products and new markets — it's incredible," said Papows, who is the highest-ranking Cullinet ex-



Cullinet's Papows: Ride was worth it

ecutive to have been on board through the entire roller-coaster ride, having joined the company 3½ years ago. "I've seen it all — from words on overhead slides to realities. It's been the richest possible experience."

It has not, he admitted, been the easiest. "The most harrowing event," he said, "was the restructuring. Planning that was a pretty grisly process because we

*Continued on page 95*

# 1-800-541-BULL.

For the straight story on cost-effective, high-volume printers, there's only one number to call.

We'd like to show you a few numbers that will make you want to call the one above. For starters, a 60 or 90 page-per-minute Bull printer can do anywhere from 200,000 to 2,000,000 pages per month. So whether you're running high-volume data processing or creating electronic forms, you get all the capacity you need for about ½ the cost of a comparable laser. And our printers' reliable non-impact technology keeps going when you need it most. Equally reliable is the company behind them. At \$5.2 billion worldwide, Bull is a systems supplier you can count on. But if big numbers don't impress you, we have something else that will. An independent survey on user satisfaction. Call for your free copy today and find out what really counts.

Bull  
Peripherals

# Study divines image tech future

BY MICHAEL SULLIVAN-TRAINOR  
CW STAFF

There's nothing like a little candy coating to make a nasty pill easier to swallow.

Image technology vendors received such medicine when a six-month study of the industry by consultants Temple, Barker & Sloane, Inc. (TBS) in Lexington, Mass., tempered vendor-generated revenue projections with recommendations for measures that TBS finds prerequisite to the imaging sector's high flight.

Based on figures derived from interviews with 350 members of the Association of Information and Image Management (AIIM), the imaging, micrographics, services and software industry association that sponsored the annual study, TBS forecast an annual 54% growth rate that would peg the electronic imaging market at \$6.8 billion by 1993.

The report updated findings of Coopers & Lybrand researchers, who studied the market for AIIM in 1987. Coopers & Lybrand's projections were significantly lower than those reported in the new TBS study. They forecast a \$1 billion market for 1991 and a \$2.4 billion market for 1996.

Despite this difference, John Frank, who directed the study for Coopers & Lybrand, agreed with the revised TBS findings. "The market is moving out much faster than our forecasts" predicted, he said.

The newer numbers, however, appear optimistic taken together with other TBS findings that assess image processing as a technology in search of acceptance.

"Someone needs to establish the legitimacy of this market with some major mainstream applications," said Robert C. Fox, one of the TBS consultants who conducted the study.

Image processing is still viewed as an experimental technology by IS and business executives, added Mark R. Bruneau, another TBS consultant who presented the study's findings at the recent AIIM trade show in San Francisco.

Two factors make the acceptance of image processing possible, Bruneau said. On the one hand, some key technologies underlying image processing are maturing. For example, the optical storage capacity and processing power to handle the large amounts of data that image systems require are just now becoming affordable.

In addition, large corporate and government organizations are fast recognizing the need to manage the paper process and integrate information so that it is easily accessible. Electronic imaging promises that capability. "But less than 1% of all organizations in this country treat their information as a strategic tool," Bruneau said. "One of the big surprises I found was that only the most advanced organizations are auditing and coordinating the processing of their information."

Vendors must educate users as to the need to gain better control of their information, the consultants said.

Bruneau added that the vendors must build user confidence in image suppliers. "There are companies that were around two years ago in imaging that aren't anymore, and big companies in the industry are undergoing difficulties," Bruneau said. "Those are not confidence-inducing events."

The image processing and microgra-

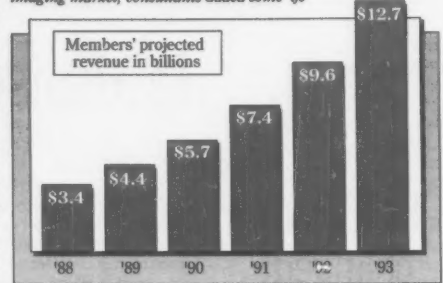
phics marketplace is in transition, the consultants noted. Consolidation will occur at a rapid pace as vendors seek the kinds of alliances required to move electronic imaging from early experimentation to widespread acceptance, those that provide the skills to integrate image with user investments in micrographics and existing information systems, Bruneau said. Independent vendors, he added, will find it hard to be successful because the market will be dominated by systems integrators or large computer vendors.

"The commitment of large vendors to imaging will allay user concerns that the company providing their \$750,000 imag-

ing system will vanish some day," Bruneau said. "The technology is not a hurdle. The biggest hurdle on the vendor side is a provinciality which entrenches them in a certain media focus. Kodak and Bell & Howell have invested millions in micrographics, and they will defend that. Other firms — Wang, Filenet and now IBM — have more recently developed their turf in imaging, which they will defend doggedly."

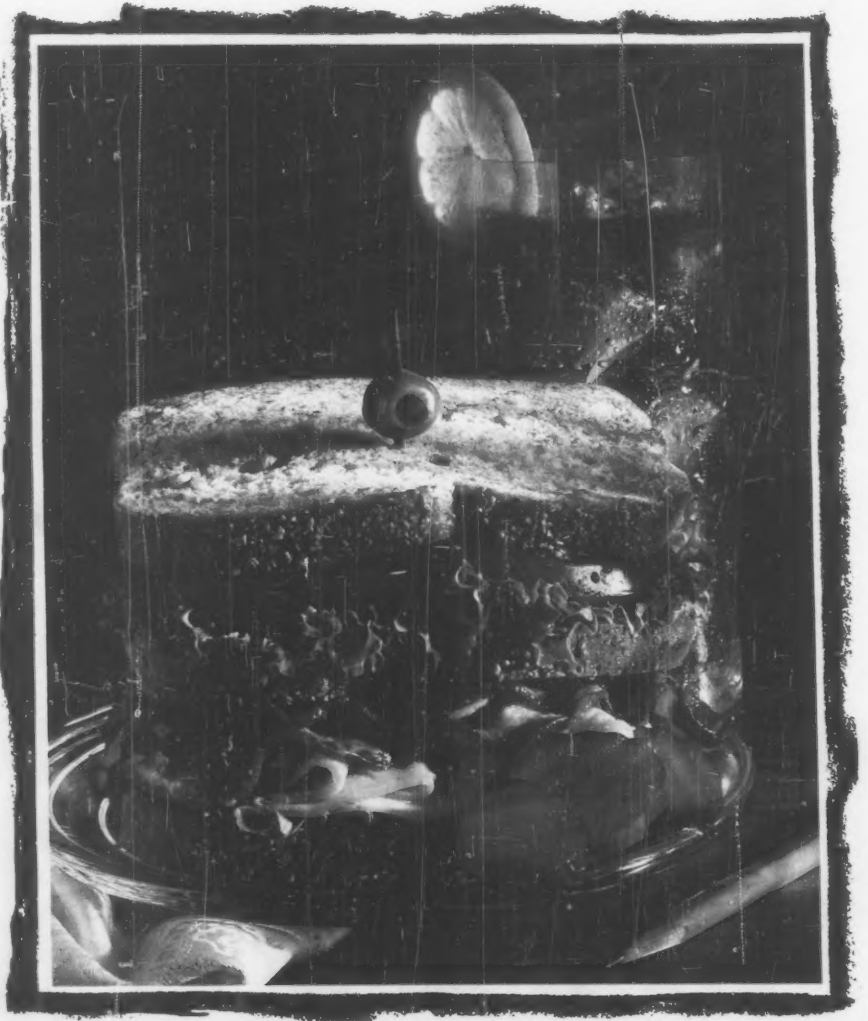
## How big is it?

Vendor members of AIIM projected a boom in the electronics imaging market; consultants added some 'ifs'



SOURCE: TEMPLE, BARKER & SLOANE, INC.

CW CHART: FRANK C. O'CONNELL



PS/2 is a registered trademark of International Business Machines Corporation © 1989 IBM Corp.



## Cullinet

CONTINUED FROM PAGE 93

weren't dealing just with numbers, but with names." Papows was referring to the spring 1988 corporate reorganization that involved the layoff of approximately 400 employees and the ultimate elimination of about 200 more jobs, a reshuffling of the executive deck and a dangerous industry perception that Cullinet's bold bid to become a multiplatform applications company instead of an IBM-locked database vendor might succeed at a brutal cost, if indeed at all.

Papows also spoke of the painful clash between research-intensive technological development and the financial immedi-

acy of serving stockholders, which kept Cullinet "between a rock and a hard place more times than I like to remember" over the past year.

### A gratifying experience

At the other extreme, however, Papows cited the planning and implementation of the Blueprint strategy as among his most gratifying experiences. Ready for the Blueprint, he said, "was the most grueling six months I remember — but look what's happened. We said that by 1990, 50% of our revenue would come from applications. We said it at a time when over 85% of our revenue came from anything but. But it's come true."

He pointed to the international spread of Cullinet — from less than 20% of reve-

nue derived from international sales in 1986 to more than 30% of revenue contributed by international operations last year — as another Blueprint promise that was kept, as was the firm's assault on the Digital Equipment Corp. marketplace.

In retrospect, Papows believes that Cullinet overreacted to the complacency that caused it to miss the early stages of such critical market trends as the rush to DEC and microcomputer platforms, the Unix operating system and IBM's DB2 database. "Our pendulum was late in swinging, so when it swung, it swung too aggressively," he said, citing acquisitions that didn't work out, leading to divestments and further wounds to an already bleeding balance sheet. "We went a little too far a little too fast."

## The least a local area network can give you is time for lunch.

Some food for thought.

Getting all the information from all your equipment to all your people can occupy all your time.

That's where the IBM Token-Ring Network can help.

With our new 16-megabit bandwidth, it provides remarkable new speed in moving everything from bulk data to mail to graphic images.

IBM's Token-Ring Network fits into most existing environments. It's compatible with today's popular software, connecting your workstations, including PCs and PS/2s®, midrange computers, mainframes and peripherals.

We've also designed it for reliability. With IBM software, it's easy to diagnose, isolate and correct problems, without affecting the rest of your network.

It's another reason why no other company connects more companies with more equipment to more people than IBM.

For more information on IBM local area network solutions, contact your local IBM Advanced Product Dealer or your IBM marketing representative.

We can help your entire organization run more smoothly and productively. And that means you can devote your time to other important matters.

Bon appétit.



## IN BRIEF

### Plying the field

With sales slowed and salaries frozen, Digital Equipment Corp. last week kicked off what promises to be a year-long process of turning manufacturing employees into marketers.

The realignment of between 3,000 and 4,000 manufacturing personnel into sales and services positions, slated for worldwide operations with an emphasis on the domestic work force, was described by a company spokeswoman as "a reinvestment in our employees."

### There goes the judge

IBM has won a backdoor victory in its long-standing battle to remove N.Y.-based federal Judge David Edelstein from his presiding role over the antitrust conflict between the computer mammoth and Pennsylvania firm Allen-Myland, Inc.

Edelstein, who has steadfastly refused to step down despite IBM's recurrent argument that he harbors an anti-Blue bias, last week ruled in favor of an IBM motion to move the case to Pennsylvania, effectively taking himself out of the action.

### Triple crown

Electronic Data Systems Corp. President and Chief Executive Officer Lester Alberthal last week added chairman of the board to his titles and duties at the \$4.8 billion General Motors Corp. subsidiary. Alberthal's ascension gives EDS its first chairman since company founder H. Ross Perot left the job and the firm in 1986.

### Buying the big guy

Houston-based Payment Services Co., which claims to be the country's largest independent Telecheck operator, last week entered into an agreement with McDonnell Douglas Information Systems Co. to acquire Telecheck Services, Inc., which is said to be the largest check acceptance franchise in the world. Annexation of the 25-year-old check-checker is expected to approximately double the annual revenue of Payment Services, currently \$53 million.

### Sunny business

Sun Microsystems, Inc., which recently warned of an imminent quarterly shortfall, announced a three-pronged financing program that will avail the company of approximately \$215 million. In addition to a revolving credit-and-loan agreement and a secured real estate loan, the financing package includes the issuance of three million Sun shares to AT&T.

## DARPA funding sheds light on U.S. innovators in high-definition TV

BY MITCH BETTS  
CWI STAFF

WASHINGTON, D.C. — The U.S. Defense Advanced Research Projects Agency (DARPA), in its effort to hand out \$30 million in grants for high-definition television (HDTV), has put the spotlight on some innovative display technology from U.S. electronics companies.

The U.S. is perceived as being far behind Japan and Europe in HDTV technology, but the proposals made to DARPA

show that "the U.S. is not totally atrophied in this kind of effort. We're showing some pluck as a competitor," commented Dale Cripps, publisher of "HDTV Newsletter" in Portland, Ore.

For example, Raychem Corp. in Menlo Park, Calif., has joined with Xerox Corp. to develop HDTV display technology "that promises to produce good liquid-crystal projectors and, ultimately, flat wall-hung screens," Cripps said.

Earlier this month, DARPA announced the first contractors expected to get

HDTV grants. The contractors selected for projection display technology were Newco, Inc. in San Jose, Calif., Raychem, Texas Instruments, Inc. in Dallas and Projectavision, Inc. in New York.

In addition, Photonics Technology, Inc. in Northwood, Ohio, was selected for plasma flat-panel displays. The values of the contracts are not yet known.

Zenith Electronics Corp. in Glenview, Ill., which sought DARPA funding for display and transmission technology, was not included in this group of awardees but could be included in the next round of contractor selections, according to Cripps.

DARPA is funding HDTV projects because the displays could be used in military systems. It also wants to strengthen the U.S. electronics industry.

## Bozman

CONTINUED FROM PAGE 93

CDC's mainframe users, who attended a meeting in Los Angeles, were already beginning to hedge their bets about the Minneapolis company's viability. Some were looking to Unix on CDC mainframes — and even on the company's ETA supercomputers — to allow future migration to other vendors' machines.

One gloomy user said, "I know it's a dying company. But we've been using Control Data computers for more than 15 years. All our applications run under NOS and NOS/VE. So we're with them, no matter what." NOS and NOS/VE are CDC's proprietary operating systems for mainframes.

This April, the future caught up to CDC. The banks that had underwritten the \$3.6 billion giant's debt were looking for cash. The decision was made to close down the ETA supercomputer division, which was soaking up nearly \$150 million in corporate resources each year. "We were two years behind in our supercomputer technology," a CDC spokesman said. Supercomputer sales were never more than 5% to 10% of CDC revenue, he added.

The bankers won. Solvency came before technology. This month, CDC took its second major step toward profitability by lopping off its \$1 billion Imprimis disk-drive division. It was sold to Seagate Technologies, Inc. for \$450 million, which reduced CDC to a \$2.2 billion corporation at best.

What does this mean for CDC users? "The Imprimis sale," the spokesman said, "will give CDC a sound balance sheet." The company is committed to profitability, according to CDC President and Chief Operating Officer Larry Pearlman. Each remaining division must pull its weight, and each must be profitable, beginning in the third quarter.

Control Data still has its Computer Products division, headed by James Usley. It also has its government and services business, which includes the well-known Ticketron and Arbitron data services. A separate Energy Management Systems division will support the utility companies that use CDC mainframes to control their power grid.

There are even promises of new products, including follow-on products to the Cyber 960 and 990 mainframes. Also, CDC's relationship with Silicon Graphics, Inc., a supplier of powerful CAD/CAM workstations, is still considered strategic, a spokesman said.

However, maintaining the status quo will be harder than ever, now that CDC, which has had financial trouble since 1985, has stripped down to fighting weight. By shedding its most profitable segment — the stable Imprimis division — the company has even fewer resources to leverage in a highly competitive marketplace.

One can only hope that something will stem any future migration from large, aging Cyber systems toward smaller, more versatile machines made by other companies. CDC's entry-level Cyber 930s and midrange 960s have a chance to do that. Air-cooled and compact, they are in step with industry trends. But the CDC that fought IBM in the 1960s, the company that pioneered 64-bit addressing and scientific computing, is no more. It has been forever changed.



"Of course we have a service plan, Chief!  
I only have to call 22 different companies."

LEASAMETRIC

Data Communications, Inc.

DATAPreference

Now you can get a complete service plan for all your PCs, peripherals, and network products. All from one company. Leasametric. No matter where your equipment came from. To find out more, call the nearest Leasametric office.

Northwest: (800) 343-7368, (415) 574-5797 • Southwest: (800) 638-7854, (818) 708-2669 • Central: (800) 323-4823, (312) 595-2700  
Northeast: (800) 221-0246, (201) 825-9000 • Southeast: (800) 241-5841, (404) 925-7980 • London Office: 011 44 923 897 000

© Leasametric, Inc. 1988

# Why Businessland Keeps Networking Itself.

As one of the world's leaders in desktop connectivity, it's hardly surprising that Businessland® is itself one of the most heavily networked organizations in the world.

In fact, Businessland operates its own business through over 130 connected LANs, integrating components from dozens of different hardware and software manufacturers. Connecting micros

to minis and mainframes located throughout the United States, Canada and England.

So, we don't just know how to network. We also know how connectivity impacts a business environment. How electronic mail not only improves communication and reduces "meeting" times, but how it opens up entirely new and more productive ways to work.

And how sharing resources can

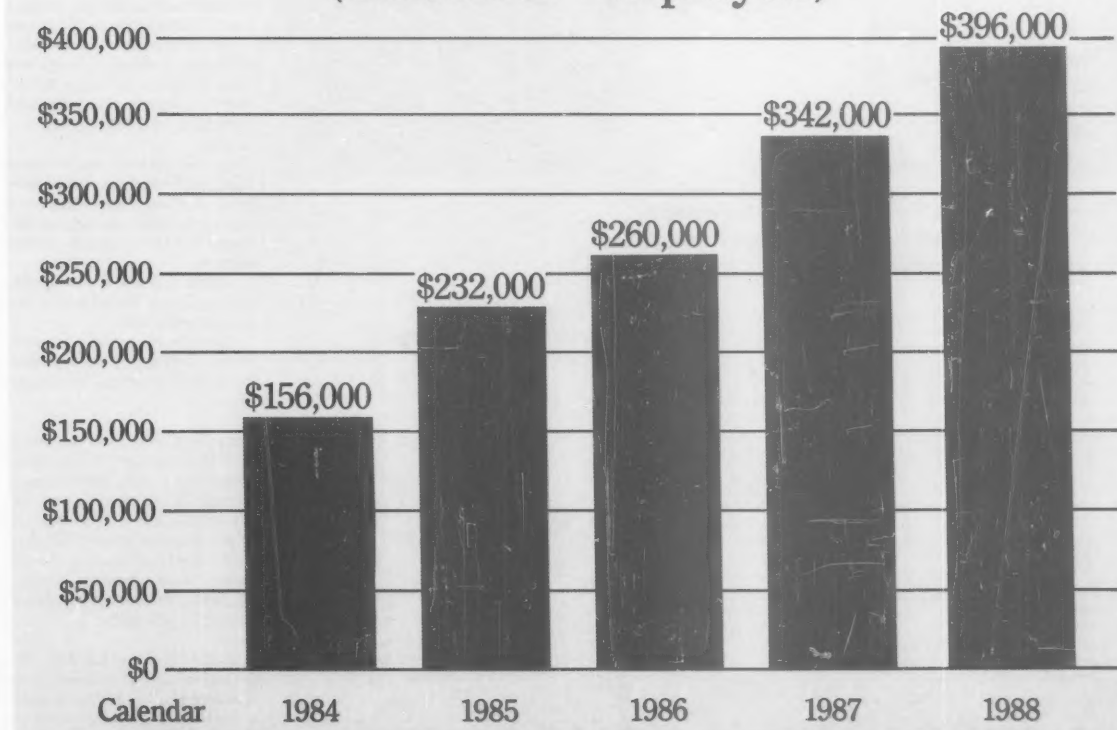
reduce expenses and support staff.

The proof? At Businessland, the sales per employee has more than doubled in five years.

So if you'd like to learn more about networking from someone who really understands it, just give us a call at 1-800-328-8383 for the Businessland Center nearest you.

**BUSINESSLAND**

## Effect Of Networking Businessland (Sales Per Employee)





## Miniscribe

CONTINUED FROM PAGE 93

Miniscribe's survival hinges largely on this product, according to Vellante. Current demand for this type of drive is high, he said.

"If they had it out today, the product would do pretty well. It's not clear that that's going to be the case in six months," Vellante noted.

Miniscribe also has Seagate Technology, Inc. breathing down its neck. "It's pretty clear that Seagate intends at some point to participate in the inch-high drive market, and it will create some extremely difficult times for Miniscribe," Vellante said.

However, the company's greatest difficulty is the perception of its poor financial position, Vellante said. "A lot of companies are going to be leery about doing business with Miniscribe," he said.

A spokesman for Compaq Computer Corp., which buys Miniscribe drives for use in its personal computers, said Compaq continues to have a relationship with Miniscribe. He noted, however, that Compaq does not rely on a sole vendor for its drives. He would not comment on the future status of the relationship between the two firms.

Miniscribe's financial prospects are murky, because of the unreliable financial reports. However, several sources expect the firm to report a financial loss for 1988 when it does file its statements.

A company spokeswoman said that Miniscribe has requested Coopers & Lybrand to reaudit the reports from 1986 through 1988. She said the accounting firm has not yet responded, but if the audits are undertaken, verifiably accurate reports could be made public in September.

Allison said he is doubtful that Miniscribe will be able to release verifiably accurate reports for those periods. Miniscribe said it believes it can determine what actually went on financially during the past three years, Allison said. "But the big question is whether the auditors will sign their names to [the report] and say this is exactly the way it was, or will they attach a lot of qualifications to it," he added.

## EXECUTIVE CORNER

### PTXI takes on Interlan exec

Irving, Texas-based PTXI has appointed **Michael Bennett** as its new president, chief executive officer and chief operating officer.

Effective immediately, Bennett will take charge of operations for the national multivendor systems integrator and microcomputer sales and service organization.

With Bennett's appointment, **Jim Price**, PTXI co-founder and current president and CEO, will become chairman of the board. His brother **Bo**, co-founder and current chairman, will act as vice-chairman of the board.

Bennett comes to PTXI from Interlan, Inc., a \$53 million, Mass.-based supplier of local-area network products, where he was president, CEO and COO.

Under his guidance, the organization reportedly netted annual revenue growth rates of more than 60%.



**PTXI's Bennett**

**Alloy Computer Products, Inc.** in Framingham, Mass., announced the appointment of **Richard G. Meise** as president, CEO and director of the company.

Meise, the former president and COO of Banyan Systems, Inc., will assume the responsibilities previously held by **Richard A. Gorgens** prior to his resignation from Alloy last February.

**Debra Robinson** is the newly appointed CEO of **Touch Technologies, Inc.**, which is a San Diego-based developer of system software for Digital Equipment Corp. VAX/VMS-based minicomputer systems.

Robinson is one of the founding members of Touch Technologies, which was established in 1982.

Her role will include determining the overall direction of the organization and its strong technical development resources.

**Gary W. Gunderson** has been elected president and CEO of **Computer Consoles, Inc. (CCI)**, which supplies fault-tolerant listing services and intelligent network applications systems to the telecommunications industry. Headquartered in Rochester, N.Y., the company is a wholly owned subsidiary of **STC PLC**, a UK-based communications and information systems company.

**Herndon, Va.-based C3, Inc.** announced the appointment of **James C. Hughes** as president and CEO. He was also elected to the board of directors of the organization.

Hughes, a senior executive at **BDM International, Inc.** for the past 12 years, replaces former president **Richard C. Litsinger**, who resigned as a result of **Knoll Capital Management L.P.'s** successful completion of its tender offer for C3's common stock.

### "Thanks to the Printer Professionals. Our High-Speed Laser Printers are a Blue Chip Investment"

Charles Schwab & Company, Inc. revolutionized the brokerage business over a decade ago by enabling its customers to buy and sell stocks at drastically reduced commission rates. Today, as America's largest discount brokerage, Schwab continues to outpace the competition through a strong commitment to technology, quality, and service.

"Last year we decided to install in-house, high-speed laser printers which would enable us to provide our customers with detailed, yet easy-to-understand statements... processed and in the mail within five days of each month end.

Selecting the right laser printer for the job was not an easy task. Our challenge was to achieve the highest possible quality without compromising reliability.

The solution? High-speed laser printers from Siemens, because we could meet the quality and customized print requirements

of our new statements... without additional software.

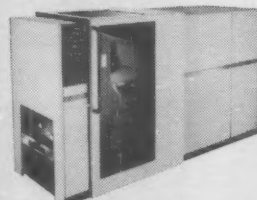
The results are impressive. Significant cost savings. Greatly improved quality and reliability. All with a system that is not only easy to operate, but maintains consistent speed, even on the most complex statement pages.

In 1984, Charles Schwab & Co., Inc. produced 3 million pieces of mail annually. Today we generate more than 1 million in an average month. To keep pace with these demands, Schwab relies on five 2200 Laser Printing Systems... and the Printer Professionals from Siemens."

*Mary V. Gorgens*

**Mary V. Gorgens**  
Vice President  
Corporate Distribution and Support Services  
Charles Schwab & Co., Inc.

### High-speed laser printing systems



Contact the Printer Professionals at:

Siemens Information Systems, Inc.  
Peripheral Systems Division  
240 East Palms Road  
Anaheim, CA 92805  
(714) 991-9700

CC/3030-035 WLM 876

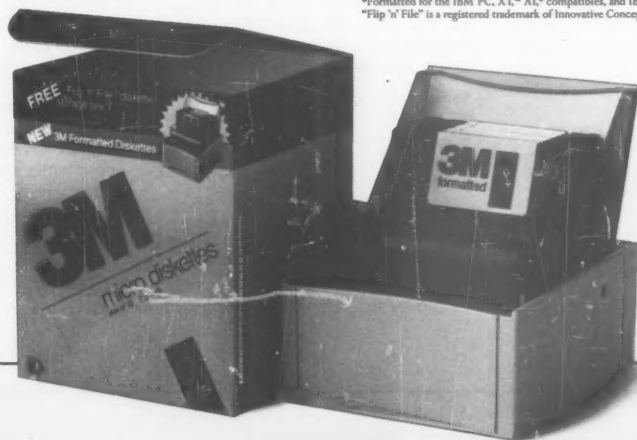


# Free Storage For Your Storage.

At 3M, we want you to try our formatted diskettes for IBM PCs,\* so we're making a terrific offer. First, we'll sell them to you for the price of our regular ones. Then,

just to make sure you can't refuse, we'll also give you a free Flip 'n' File® to store them in. So look for the specially marked boxes at participating dealers.

\*Formatted for the IBM PC, XT,® AT,® compatibles, and IBM PS/2.® Offer good while supplies last.  
®Flip 'n' File® is a registered trademark of Innovative Concepts, Inc.



# COMPUTER CAREERS

## IS in search of a new drug

Pharmaceutical industry holds prescription for healthy systems growth

BY DAVID A. LUDLUM  
CW STAFF



Forces as diverse as bureaucratic delay and the fight for animal rights are helping to drive opportunities for information systems professionals in the high-tech world of pharmaceutical computing.

In the pharmaceutical industry, scientific computing for research and development offers just as many career opportunities as business systems, says Jerry Paules, executive director of IS at Ciba-Geigy Corp. in Summit, N.J. "The pharmaceutical industry is research-driven," says Paules, who oversees both scientific and business systems at Ciba-Geigy. The emphasis on research spawns opportunities in scientific computing, he says.

There are some constraints for professionals in pharmaceutical computing, such jobs call for teams of "hybrid" computer professionals with knowledge of biology, molecular chemistry, modeling techniques and pharmacology, says Richard Davis, vice-president of IS services at Johnson & Johnson Consumer Products, Inc. in New Brunswick, N.J.

Pharmaceutical computing

professionals should hold at least an undergraduate degree in science, Paules says. "Frankly, a master's or Ph.D. is weighted very heavily," he says. "Most of our managers in research computing have a master's and, more frequently, a Ph.D."

Ciba-Geigy recruits many of its scientific computing professionals from campuses, targeting holders of science degrees and training them in computer science. Paules says, "A lot of our [computing personnel] are grown internally."

Additionally, forces are at work to slow the pharmaceutical industry's traditionally rapid rate of growth and high profitability. Paules says the principal ones include the inroads of generic drugs, initiatives by the federal government to contain health care costs, a greater number of products competing directly with one another and industry consolidation. However, industry growth may remain above 10%, he says.

Opportunities for computer professionals may be limited as chemists and other scientists who use pharmaceutical systems become more self-reliant with the sophisticated computing tools, says Jeffrey Landau, a Radnor, Pa.-based consultant and former head of systems at Pfizer, Inc.'s pharmaceutical di-

vision. As the users become more self-sufficient, opportunities for computer specialists may slow, Landau says.

Probably the most exotic scientific application in the industry is computer-aided molecular design (CAMD), which makes use

to Jeffrey Schubert, a scientific programmer/analyst at Abbott Laboratories in Abbott Park, Ill.

With its emphasis on rapid product development, pharmaceutical computing tends to rely on packaged software from vendors such as Molecular Design Ltd. in San Leandro, Calif., and Polygen Corp. in Waltham, Mass. Abbott, however, has developed its own graphics software.

"When the graphics work

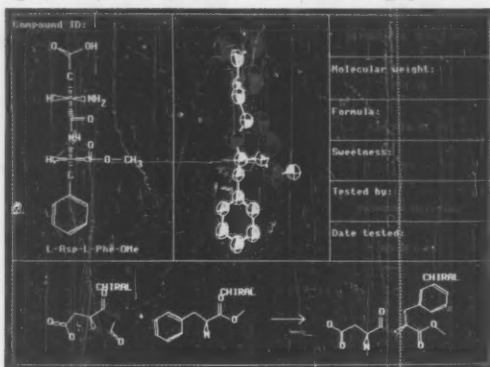
Perhaps the largest component of pharmaceutical computing is clinical systems — those used in helping to comply with federal government standards for ensuring that new drugs are safe and effective.

"The amount of testing that must go on is absolutely enormous; I have heard of 90 volumes [of reports] representing one drug," Landau says. Data from tests on drugs must be statistically analyzed for such problems as side effects when the drugs are used with others or by patients with certain conditions.

Speeding up that process is key because the patent issued at the discovery of a new drug lasts 17 years, and it can take 10 years to get the drug approved by regulators, Landau says. Pharmaceutical companies will likely extend these clinical systems to include electronic links with government regulators, creating opportunities in communications, according to Davis. "I'd be surprised if it's not happening in the next year or two," he says.

The future may hold a more sweeping innovation in the development of computer models to simulate the animals used in drug testing, according to Davis. "It's not something that one clever person is going to come up with a solution for," he says. "It's going to require a big investment over a period of years."

Ludlum is a Computerworld senior writer.



A screen from Molecular Design's chemical software package

of computation, graphics and database technologies to study the interaction of chemical compounds with cells in the body.

One goal of CAMD is to extrapolate proposals for new drugs on the basis of simulations. Among computer professionals, CAMD has not gained recognition as a distinct field in the way it has among chemists, according

to Jeffrey Schubert, a scientific programmer/analyst at Abbott Laboratories in Abbott Park, Ill. "When the graphics work

## The Professional vs. The Enthusiast

The Professional does a job and does it well. But the Enthusiast is someone whose level of ambition turns contributions into achievements. In short, the Enthusiast is someone who's ideal for Executive Life. Why? We're California's #1 life insurance company, we're dedicated, we reward performance, and we're looking for Programmers who can excel in our IBM environment.

A knowledge of life insurance products and a background in COBOL, Assembler, CICS (Command/Macro),

and troubleshooting with IBM equipment using OS/MVS XA, TSO/ISPF is required. Exceptional candidates from other financial fields will be considered.

You may be one of the Enthusiasts we're looking for... ready to be acknowledged for much more than just your presence. If so, consider a career with Executive Life.

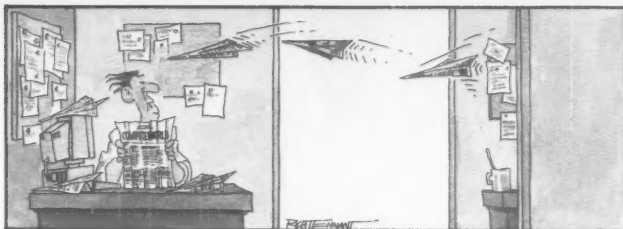
The right candidates will receive an excellent salary and comprehensive benefits, including medical/dental/life insurance, a health and fitness center, employee restaurant, child resource

program, flexible spending account, tuition reimbursement, and much more. To apply, contact John McFarland at 1-800-323-8617 or 213-312-2311, or send your resume to: Executive Life, Human Resources, Dept. #0619CW, 11444 West Olympic Boulevard, Los Angeles, CA 90064. We are an equal opportunity employer. Principals only, please.



EXECUTIVE LIFE

*This is the life*



"YOU KNOW, WHEN I ASKED TO BORROW YOUR COMPUTERWORLD I SORT OF HOPED I'D GET THE WHOLE THING AT ONCE."

**YES,** I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$44.00\* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of **COMPUTERWORLD** Focus on Integration.

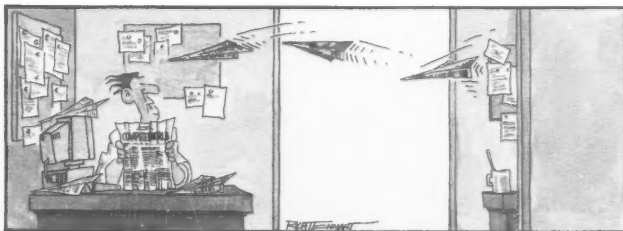
First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
 Title \_\_\_\_\_ Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year  
 \*U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**

E4926-6



"YOU KNOW, WHEN I ASKED TO BORROW YOUR COMPUTERWORLD I SORT OF HOPED I'D GET THE WHOLE THING AT ONCE."

**YES,** I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$44.00\* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of **COMPUTERWORLD** Focus on Integration.

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
 Title \_\_\_\_\_ Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year  
 \*U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**

1. BUSINESS/INDUSTRY (Circle one)  
 10. Manufacturer (other than computer)  
 20. Finance/Insurance/Real Estate  
 30. Medicine/Law/Education  
 40. Wholesale/Retail Trade  
 50. Business Service (except DP)  
 60. Government — State/Federal/Local  
 85. Communications Systems/Public Utilities/Transportation  
 70. Mining/Construction/Petroleum/Refining/Agriculture  
 90. Manufacturer of Computers, Computer-Related Systems or Peripherals  
 95. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting  
 99. Computer Peripheral Dealer/Distributor/Retailer  
 75. User/Other \_\_\_\_\_  
 95. Vendor/Other \_\_\_\_\_ (Please specify)

2. TITLE/FUNCTION (Circle one)  
 15. MIS/DP MANAGEMENT  
 18. Vice President, Asst. VP  
 21. Dir. Mgr. Suprv. IS/MIS/DP Services  
 22. Dir. Mgr. Suprv. of Operations, Planning, Adm. Services  
 23. Dir. Mgr. Suprv. Analyst of Systems  
 24. Dir. Mgr. Suprv. of Programming  
 25. Programmer, Methods Analyst  
 26. Dir. Mgr. Suprv. O&M/WP  
 28. Data Comm. Network/Systems Mgt.  
 OTHER COMPANY MANAGEMENT  
 11. President, Owner/Partner, General Mgr.  
 12. Vice President/Asst. VP  
 13. Treasurer, Controller, Financial Officer  
 41. Engineering, Scientific, R&D Tech. Mgt.  
 51. Sales/Mktg. Mgt.

- OTHER PROFESSIONALS  
 60. Consulting Mgt.  
 70. Medical, Legal, Accounting Mgt.  
 80. Educators, Journalists, Librarians, Students  
 90. Others \_\_\_\_\_ (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant:  
 A. Mainframes/Supers  
 B. Minicomputers/Small Business Computers  
 C. Microcomputers/Desktops  
 D. Communications Systems  
 E. Office Automation Systems  
 F. No Computer Involvement

1. BUSINESS/INDUSTRY (Circle one)  
 10. Manufacturer (other than computer)  
 20. Finance/Insurance/Real Estate  
 30. Medicine/Law/Education  
 40. Wholesale/Retail Trade  
 50. Business Service (except DP)  
 60. Government — State/Federal/Local  
 85. Communications Systems/Public Utilities/Transportation  
 70. Mining/Construction/Petroleum/Refining/Agriculture  
 90. Manufacturer of Computers, Computer-Related Systems or Peripherals  
 95. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting  
 99. Computer Peripheral Dealer/Distributor/Retailer  
 75. User/Other \_\_\_\_\_  
 95. Vendor/Other \_\_\_\_\_ (Please specify)

2. TITLE/FUNCTION (Circle one)  
 15. MIS/DP MANAGEMENT  
 18. Vice President, Asst. VP  
 21. Dir. Mgr. Suprv. IS/MIS/DP Services  
 22. Dir. Mgr. Suprv. of Operations, Planning, Adm. Services  
 23. Dir. Mgr. Suprv. Analyst of Systems  
 24. Dir. Mgr. Suprv. of Programming  
 25. Programmer, Methods Analyst  
 26. Dir. Mgr. Suprv. O&M/WP  
 28. Data Comm. Network/Systems Mgt.  
 OTHER COMPANY MANAGEMENT  
 11. President, Owner/Partner, General Mgr.  
 12. Vice President/Asst. VP  
 13. Treasurer, Controller, Financial Officer  
 41. Engineering, Scientific, R&D Tech. Mgt.  
 51. Sales/Mktg. Mgt.

- OTHER PROFESSIONALS  
 60. Consulting Mgt.  
 70. Medical, Legal, Accounting Mgt.  
 80. Educators, Journalists, Librarians, Students  
 90. Others \_\_\_\_\_ (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant:  
 A. Mainframes/Supers  
 B. Minicomputers/Small Business Computers  
 C. Microcomputers/Desktops  
 D. Communications Systems  
 E. Office Automation Systems  
 F. No Computer Involvement

E4926-6



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

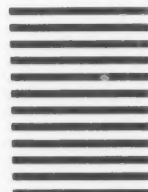
POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

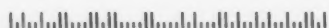


**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144





# Catch the Fourth Wave in an Inland Paradise.

## Open Systems and Open Spaces for the Industry's Top Software Engineers!

Network computing based on "open," distributed systems. Appropriately dubbed "the fourth wave," it's the next act in computer technology's dazzling, unending performance. And what an enormous challenge it presents.

If you're a future-minded software engineer, you're aware of the challenge. If you're career-minded, you should also know that few companies are as prepared to meet this challenge as Unisys Corporation's Network Computing Group.

NCG, organized and fine-tuned to respond to the demands of the open systems market, exists for one reason: to develop and market networking solutions that offer rapid, cost-effective access to information—across all platforms—for all of its customers.

Imagine what working within a charter like that can do for your career. Then, imagine what Utah's world-class living can do for your peace of mind.

## The Salt Lake Valley Good Life!

No other place offers opportunities for living like this! Explore the magnificent deserts and canyonlands of five spectacular national parks. Ski waist-deep powder just minutes from home. Camp, hike and climb in Utah's mighty Rockies. Golfing, biking, boating—they're all right here.



## Software Engineers, Start Living!

If you're a top software engineer, explore this exceptional opportunity to catch the network computing wave. In one of the most livable places in the country. With the company determined to become the largest provider of open network systems in the world.

Match your expertise against the exciting, career-developing work in the following Unisys NCG groups. Minimum requirements include a B.S. in computer science or a related discipline and two or more years of experience.



### Database

Our Environmental Software Database group provides RDBMS technology across Unisys UNIX™ platforms. Excellent opportunities for top software engineers who have strong backgrounds in Oracle, Ingres, and Multiplex include:

- **Software Portation**—You'll work closely with hardware, operating systems and other groups to develop, test and port to applicable hardware platforms; test and package for worldwide distribution.
- **Software Assurance**—You'll help Unisys maintain its reputation for high-quality products by performing regression and new product testing on new UNIX products, hardware platforms and tools.

### Languages

The Unisys Environmental Software Language organization works closely with hardware and operating system groups in addition to a variety of UNIX OEM vendors to provide a breadth of advanced compilers, debuggers and related software development tools across the Unisys UNIX platforms. The group currently supports COBOL, FORTRAN, Pascal, RPG III and Basic.

### Data Entry Operations

Responsible for the development and support of all Unisys data entry products, this group's major focus is two-fold: DCR-UNIX products for major, UNIX-based platforms; and the PC-to-UNIX communications interface PCU. Additionally, this group provides presentation, benchmark and training support to marketing personnel.

### Secure UNIX

Secure UNIX develops and supports UNIX-based systems for the National Computer Security Center (NCSC) and other DoD agencies. The environment includes CompuSec (levels A1, B1, B2, B3, C1 and C2) and Trusted Computer System Evaluation Criteria.

### On-Line Transaction Processing

This group defines, develops and supports transaction processing software products and is currently investigating transaction processing for Unisys UNIX hardware platforms.

### UNIX Workstation

The UNIX Workstation organization defines, develops and supports a complete line of Unisys UNIX family-compatible workstations and provides a consistent, sophisticated user interface for UNIX workstations and servers.

### UNIX Standards

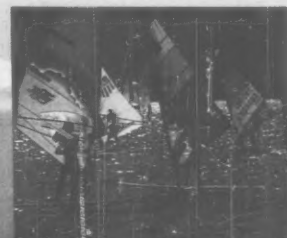
You'll help represent Unisys to the industry associations now determining the future of UNIX and add value to Unisys products through innovative implementations of standard UNIX applications.

### Host Interconnect

Develop and apply your professional skills on some of the fastest growing disciplines in the industry as you play a key role in the integration of traditional host interconnect applications into the exciting open systems approach. This group's far-reaching variety of work includes the development and portation of IBM and Unisys terminal emulators onto UNIX-based systems, integrating these proprietary-terminal emulators into open communication systems, and applying new user interface technologies to traditional screens.

### Systems Software

Broaden your UNIX expertise by developing and porting new system software features and integrating them into the latest UNIX release; verifying and evaluating systems software performance; and providing solutions for customers through your knowledge of UNIX internals and applications/OS interface.



### Communications

Unisys UNIX systems provide a variety of exciting opportunities in data communications protocols and applications, including local and wide area networking, host communications for data, binary graphics, and UNISCOPE, a series of disciplines, and the exciting world of OSI, PC-based and defense data networks.

Please send your résumé, indicating your area of interest, to Unisys Corporation, Human Resources Department, 1000 North 10th Street, Salt Lake City, UT 84103.

For more information, contact: Unisys Corporation, 1000 North 10th Street, Salt Lake City, UT 84103. Tel: (801) 464-1000. Fax: (801) 464-1001.



## A CAPITAL IDEA

Raleigh, the capital city of North Carolina, is one dynamic component of the Research Triangle, providing excellent educational, cultural and recreational resources.

As a result of key automation initiatives, the North Carolina Department of Revenue has excellent career opportunities for experienced automation professionals with proven track records of success. We offer excellent benefits and competitive salaries in addition to a desirable location.

### \*\*\* SENIOR DATABASE ANALYST \*\*\*

Logically designs and physically implements databases, serves as a resource person, carries out complex projects under general supervision and serves as a project leader. Additional duties: analyzing requirements, planning and designing databases and consulting with application development and technical personnel. BS CS/MIS or related field and 4 yrs exp in programming and application analysis, with at least 2 yrs database design.

Requires:

\* ORACLE \*

Will consider:

\* DB2 \* \* SQL \*

### \*\*\* SYSTEMS PROGRAMMER \*\*\*

Installs, implements and monitors the accuracy and performance of operating systems and ancillary proprietary software. Primary system is an IBM 4381-14 networked with VAX clusters through DECNET and other large IBM systems through SNA. BS CS/MIS or related field and 3 yrs exp in systems, applications or database. Skills should include systems programming, computing systems failure analysis, systems generation, software installation and recent operating systems/software maintenance exp. The operating environment consists of:

\* MVS/XA \* \* GENER/OL \* \* CICS \*  
\* ROSCOE \* \* NCP \* \* VTAM \*

Education, potential, desire to work hard, and ability to learn can be considered in lieu of experience. For consideration, send detailed resume and salary history, in confidence to:

NORTH CAROLINA DEPARTMENT OF REVENUE

Personnel Office

P.O. Box 25000

Raleigh, North Carolina 27640

FAX: (919) 733-3149

EOE/AA

THE NORTH CAROLINA DEPARTMENT OF REVENUE

## FLORIDA'S WORLD IS YOURS.

We're Software Services of Florida, providing data processing consulting services to major corporations and small companies.

### • PROGRAMMERS • PROGRAMMER ANALYSTS • SYSTEM ANALYSTS • SYSTEM PROGRAMMERS • DATA BASE ANALYSTS

with expertise in the following areas:

- COBOL, CICS, IMS, DB-2, SQL
- C, ASSEMBLER, UNIX, SQL
- DB-2, CDP
- ADA, VAX
- COBOL, VAX, VMS
- COBOL, ITX, NCR
- FORTRAN, INTERGRAPH
- RPG, SYS/36, AS 400
- FOCUS, X-EDIT

Call toll-free National:

**1-800-237-8181**

Florida only:

**1-800-282-4141**

or send resume to: Cy Dougherty, Personnel Director

Paragon Crossing, Suite 124, 11300 - 4th St. N.,

St. Petersburg, FL 33716

Paid Relocation — Excellent Benefits — Salary Commensurate with Experience

**SOFTWARE SERVICES OF FLORIDA INC.**

A subsidiary of ORRISON INTERNATIONAL INC.

## COMPUTER CAREERS



## OVER 100 NEW PROJECTS ARE ON THE RUNWAY.

At United Airlines, MIS is playing a larger strategic role than ever before. We're growing worldwide. And to support our growth, we're expanding our technology base to include:

- Distributed PC/Mainframe Networks
- Multiple DB2 Projects
- PS2/Model 70 Workstations
- LANS, CASE, FOCUS, VS COBOL II, C, IDMS, ADS/O, PC BASIC, SAS

Our areas of concentration include:

- Marketing Decision Support
- Finance
- Cargo Operations
- Human Resources
- Airline Operations
- Food Service Operations

You really should take the time to see what we're going to develop. This is a long-term commitment that creates an excellent career environment for you. Positions available include:

**Programmer Analysts  
Sr. Programmer Analysts  
Systems Design Analysts**

**Systems Analysts  
MIS Technical Instructor**

If you have IBM MVS/COBOL or BAL experience and the desire to be involved in new project development...

**TALK TO OUR PROJECT MANAGEMENT TEAM  
CALL OUR HIRING HOTLINE 1-800-637-2839  
Wednesday, June 28, 8AM-7PM (Central Time)**

- Travel Benefits • Competitive Salaries • Solid In-House Training
- Comprehensive Life & Medical • Retirement Program

If unable to call, send a resume in confidence to: Professional Employment/EXOEJ-CW06-056, United Airlines, P.O. Box 66100, Chicago, IL 60666. Equal Opportunity Employer. Principals Only.

# UNITED

A I R L I N E S

### Manager of Systems Development to \$0,000

Industry leader seeks progressive MIS executive that has exposure to financial, marketing, and banking systems. Individual must have 10+ yrs of systems development in a trading environment. Familiarity with both IBM and DEC environments is a definite plus. This is an outstanding position with a leader in the financial services industry.

**ROBERT WILF**  
DATA PROCESSING  
7733 Forsyth Blvd.  
St. Louis, MO 63105  
(314) 727-1535  
FAX: (314) 727-1321

Senior Engineer in an Advanced Development Group. Responsibilities include analytical studies of signal processing strategies for recording systems. Requirements are a Ph.D. in Electrical Engineering with a background in digital communication theory, error correcting coding theory and digital signal processing including adaptive equalization techniques. Expertise in Fortran programming language and VMS is required. No experience required. Salary: \$50,752.00 to \$55,752.00. If you are interested in and qualified for the above position, please forward your resume to: Massachusetts Division of Employment and Training, Special Programs Department, Case #9902, 19 State Street, Boston, MA, 02114.

### PROGRAMMERS Contract Assignments \$25-30 Per Hr. +

Jr. to Sr. level programmers with 1+ yrs. exp. in IBM & other languages (PASCAL, C, ASSEMBLER, PL-1, etc.). Contract assignments 12 mos. + \$25-30/hr. + benefits package. In confidence, contact Al Williams, CEC.

**CORPORATE PERSONNEL CONSULTANTS, INC.**  
3765 Leland Drive, Suite 202  
Charlotte, NC 28211  
(704) 395-1000

## Systems Analyst Opportunities

Parke-Davis Pharmaceutical Research Division, a Warner-Lambert Company and worldwide leader in the development, manufacturing and marketing of pharmaceutical, consumer and health care products, is presently seeking to fill three high-level computer analyst positions in the Pharmaceutical Research Facility in Ann Arbor, Michigan. These positions are necessary to support a new and exciting science recently initiated for drug discovery.

**Senior Systems Specialist** - The incumbent will be responsible for all phases of systems development, project management and systems implementation involving both mainframe and personal computer program documentation, coding, testing and validation. A minimum of 7 years' experience with IBM mainframe and a bachelor's degree in a technical discipline or equivalent experience is required. IBM 30XX MVS/XA, TSO/ISPF, PL/I, ORACLE required.

**Senior Systems Analyst** - The incumbent will be responsible for evaluation of user requirements, development of computer system specifications and systems implementation involving both mainframe and personal computer program documentation, coding, testing and validation. A minimum of 5 years' experience in scientific lab computer applications and a bachelor's degree in a technical discipline or equivalent experience is required. PC/XT/AT/PS-2, MS/PC-DOS, C, ORACLE required.

**Oracle Systems Analyst** - The incumbent will be responsible for evaluation of user requirements, development of computer system specifications and systems implementation involving mainframe and PC program documentation, coding, testing and validation. A minimum of 5 years' experience with IBM mainframe and personal computers and a bachelor's degree in a technical discipline or equivalent experience is required. Computer programming in several languages or systems development with preference given to PL/I, ORACLE, SAS, C and Superlink desirable.

We offer an excellent salary and benefit package in addition to a superb working environment. Please send resume and salary requirements in confidence to: **Ms. L. Dalley, Human Resources, Parke-Davis, 2800 Plymouth Road, Ann Arbor, MI 48105.**

**PARKE-DAVIS**  
DIVISION OF WARNER-LAMBERT COMPANY

"Equal Opportunity in Action"





**THE UNIVERSITY OF TEXAS  
MEDICAL BRANCH  
AT GALVESTON**

## BUILD YOUR FUTURE WITH UTMB

THE UNIVERSITY OF TEXAS MEDICAL BRANCH, on Galveston Island, located 50 miles south of Houston, is embarking on new technology programs. Several new opportunities are currently available:

Online applications are supported by the use of CICS/VS teleprocessing system. More than 1,000 user devices are active on this growing network. An IBM 308C production system and an IBM 3081K test system are operational 24 hours a day. Software products used include: CICS/COBOL, PCS, DL1, MVS, TSO, FOCUS, and VSAM.

### MANAGER OF INFORMATION SYSTEMS

Coordinate resources to support the institutional information center. Qualifications required include five years experience as a manager in data processing, with a minimum of two years experience managing an information center.

### DATA ADMINISTRATOR

Establish a Data Administration function, to include the implementation of a data model to support an information systems plan and the selection and implementation of a data dictionary. Five to eight years of data processing experience to include four years of experience in application technical support and data/data base administration is required.

### APPLICATION DEVELOPMENT AND IMPLEMENTATION PROJECT MANAGER

Manage resources that develop or install purchased applications in business, academic, and hospital systems. Four to six years experience in large applications development and implementation, with two years experience in a supervisory role is required.

### METHODS MANAGER

Select and transfer new technology to application personnel by installing and implementing software tools. Three to six years experience as a programmer analyst using project management tools is required.

### PROGRAMMER ANALYSTS 2 POSITIONS

Develop, install, or maintain business, academic, and hospital applications. One year experience as programmer analyst using the technology identified above.

All of the above positions require excellent interpersonal, planning, and organizational skills. A bachelor's degree is preferred. Experience in a medium to large mainframe environment is preferred.

Send a cover letter identifying the position you are applying for, with a detailed resume and salary history, to: Dept. of Human Resources, The University of Texas Medical Branch, Box 146, UTMB Substation 1, Galveston, TX 77559-2274.

UTMB HIRES ONLY INDIVIDUALS AUTHORIZED TO WORK IN THE UNITED STATES.  
UTMB IS AN EQUAL OPPORTUNITY M/F/H/V AFFIRMATIVE ACTION EMPLOYER

## STEP INTO YOUR FUTURE

National Programming Services, a data processing consulting company, is currently seeking computer professionals with experience in the following:

- COBOL, CICS • DEC/VAX
- IDMS ADS/O • S/38
- IMS/DB2 • ADABAS/NATURAL
- ORACLE • DOE "Q" CLEARANCE

If you would like your future with a company where you can achieve your potential and be rewarded for it, please call or send your resume to:



NATIONAL PROGRAMMING SERVICES, INC.

121 EXECUTIVE CENTER DRIVE □ SUITE 240  
COLUMBIA, SOUTH CAROLINA 29210  
(803) 772-9412 □ FAX (803) 772-0943

**800-874-9595**



### Information Systems Consulting

ISC IS A PROGRESSIVE NATIONAL FIRM SEEKING MOTIVATED PROFESSIONALS LOOKING FOR A NEW CHALLENGE. EXCELLENT BENEFITS FOR THOSE WHO QUALIFY.

### Experience Required In:

- DB2 ORACLE
- IMS DB/DC C/VAX
- CICS AS 400
- Adabas C/UNIX
- TELON Cobol

TAKE CHARGE OF YOUR PROFESSIONAL FUTURE

340 Providence Towers East, L.B. 9  
5801 Spring Valley • Dallas, Texas  
75244 • 1-800-877-1881 • 214-498-1881

Dallas, Houston, Kansas City, St. Louis, Atlanta, Los Angeles

## SYSTEMS PROGRAMMER DATA PROCESSING

The Toledo Hospital is currently seeking the right individual to round out our Systems Programming staff. We offer a state-of-the-art environment running MVS/XA on a 3090-IBOE. We need an experienced MVS Systems Programmer capable of installing, maintaining, and trouble-shooting all mainframe software including MVS/XA, CA-1, VTAM, and NCP, in addition to system performance monitoring and tuning.

The qualified candidate is required to have a Bachelor's Degree in Computer Science or related field and a minimum of 3 years' experience as a Systems Programmer in an MVS software environment. Experience in large IBM systems design and operations are a must, as is knowledge of the SMP/E installation process and MVSCPI/IOC generations. Excellent oral and written communication skills as well as working knowledge of CICS, IMS/DB, and project management concepts preferred.

Interested candidates possessing minimum requirements, please send resume and salary requirements to:

Jill R. Honeck, R.N.  
Employment/Recruitment  
Specialist

**The Toledo Hospital**  
2142 North Cove Blvd.  
Toledo, OH 43606

Equal Opportunity Employer



## RESEARCH PROGRAMMER

This position is a full-time academic professional staff member of the National Center for Supercomputing Applications. This position involves computer systems support for workstations and network servers for NCSA. The work will involve the installation and integration of workstations with software, operating systems and networks customized for use in a research environment. Responsibilities include but are not limited to installation, system administration, and programming support of Silicon Graphics computers and other Unix workstations on the NCSA Local Area Network utilizing TCP/IP and DECnet protocols. Staff member must carry beeper and be on-call for designated critical systems.

### QUALIFICATIONS:

- B.A. or B.S.
- Experience with Unix, System Administration and/or Silicon Graphics computers
- Highly desirable additional experience includes experience with Local Area Networks, HYPERchannel, TCP/IP, Proton, C programming, and graphics computer.

This is a twelve month, 100% time appointment with regular University benefits. Salary is commensurate with experience. The starting date is as soon as possible.

To ensure full consideration, please send letter of application, resume, and three references by July 21, 1989 to:

Ginger Winkler  
**National Center for Supercomputing Applications**  
152 Computing Applications Building - CW  
605 E. Springfield Avenue  
Champaign, IL 61820  
(217) 244-1989  
The University of Illinois is an Affirmative Action/  
Equal Opportunity Employer

## PROGRAMMER/ANALYST

NAI, a data processing consulting company, has immediate openings in the Bloomington/Peoria, Illinois area for Programmer/Analysts and System Designers seeking a challenging career in data processing consulting. Candidates should be professional, highly motivated, and possess excellent communication skills. Bachelor's degree or equivalent, and at least 3-5 years experience in one of the following:

- IMS DB/DC • CICS • DB2
- Full-time permanent positions • Career development
- Excellent salaries • Full benefits
- Exciting projects • Technical Education

If you like a challenge, enjoy working with people, and like to learn new technologies, then you are a candidate to join the NAI team.

For more information, call Charles Miller, or send resume in confidence to:

**NAI**  
NIMS ASSOCIATES, INC.  
2422 East Washington Street • Bloomington, Illinois 61704 • (309) 662-9454  
Decatur, IL • Champaign, IL • Danville, IL • Indianapolis, IN

## MANAGER, SYSTEMS DEVELOPMENT OHIO UNIVERSITY

Ohio University is searching for an individual to direct the administrative systems development activities and related support functions. The Manager is responsible for directing a qualified professional staff; serving as consultant to clients in the selection of software packages; functioning as an advisor to project leaders in the analysis, design and implementation of automated administrative computer applications; and designing and implementing program development methodologies and standards.

Minimum academic requirement is a Bachelor's degree; a Master's degree is preferred in Computer Science, Business Administration or related field. A minimum of eight years DP experience; supervisory and project management experience in a large IBM mainframe environment.

Ohio University's computing environment is very progressive with modern hardware, software and networking technologies.

Salary: \$40,000 - \$50,000

Send letter of application, resume, and names of three references, by July 9, 1989, to: Barbara Incze, Director, University Computing and Learning Services, Ohio University, 228 Hening Hall, Athens, Ohio 45701.

APPLICATIONS FROM WOMEN AND MINORITIES  
ARE STRONGLY URGED

## Looking for qualified computer professionals?

Look no further. More than 612,000 computer-involved professionals read Computerworld every week. And you can reach all of them—or just the ones in your region—with a regional or national recruitment ad in Computerworld's Computer Careers section.

For more information or to place your ad, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

# COMPUTER CAREERS NETWORK

Now you can recruit the best qualified computer and communications professionals regional, nationally and weekly.

### How?

With IDG Communications new Computer Careers Network. Choose from the Network's five computer-related newspapers and tailor your recruitment message to the type of talented professionals you need to reach—professionals that read Computerworld, InfoWorld, Network World, Digital News, and Federal Computer Week. Then, target your audience by region. Or blanket the entire nation.

Call your local sales representative today for more information about Computer Careers Network's regional, national and weekly reach.

### Sales Offices

John Corrigan, Classified Advertising Director, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171; 508-879-0700. **BOSTON:** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171. Nancy Percival, Regional Manager, 508-879-0700; Andrew Rowe, Account Executive, 800-343-6474. **NEW YORK:** Paramus Plaza 1, 140 Route 17 North, Paramus, NJ 07652; Warren Kolber, Regional Manager, 201-967-1350; Jay Novack, Account Executive 800-343-6474. **WASHINGTON, D.C.:** 8304 Professional Hill Drive, Fairfax, VA 22031; Katie Kress, Regional Manager, 703-573-4115; Pauline Smith, Account Executive 800-343-6474. **CHICAGO:** 10400 West Higgins Road, Suite 300, Rosemont, IL 60018; Patricia Powers, Regional Manager, 312-827-4433; Ellen Casey, Account Executive 800-343-6474. **LOS ANGELES:** 18004 Sky Park Circle, Suite 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-250-0164; Chris Glenn, Account Executive, 800-343-6474. **SAN FRANCISCO:** 18008 Sky Park Circle, Suite 145, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-250-0164; Chris Glenn, Account Executive, 800-343-6474.



## System One

System One Corporation, a leading edge information management and computer automation company, is expanding its staff to meet our customers' need for today and the future. Come join us and be part of a high growth technology based company. Our Houston based Data Center is looking for a few good people to fill the following positions:

### Sr. Programmer/Analyst

Extensive knowledge in financial systems programming using: COBOL, MVS/OS, IBM/MSA and 4-5 years of experience with general ledger/fixed asset operating systems is required. The incumbent will design, code, and test our programs for accounting systems. Replies to File #72/CW.

### Applications Programmer/Software Designer

A broad base of experience in all Tandem technologies coupled with recent exposure to automated application development (SQL, TAL) are required. This position will be involved in the development of applications to automate current manual functions. Replies to File #73/CW.

### Systems Specialist

A solid knowledge of I/O subsystems performance and DF/HSM products coupled with a good understanding of equipment acquisitions and capacity planning are required. This position is responsible for supporting the storage management function which includes installations, maintenance, and support. Replies to File #74/CW.

Bring your leadership skills to System One Corporation. They'll be right at home. We offer an excellent compensation and benefits package including travel privileges. Send a resume with salary history, indicating position of interest, to System One Corporation, Human Resources, Dept. JG/HTC, 1301 Fannin, Suite 1800, Houston, Texas 77002-7009. We are an equal opportunity employer. Principals only/no phone calls, please.

Software Engineer/Systems Design & Development. 40 hrs/wk, 8-5, \$30,000/yr. Design & development of communication software for data distribution systems using UNIX & C, of systems software for data bases in data distribution & network software systems using UNIX & C, & of PC versions of data distribution systems running under XENIX for communication with remote systems through local area networks. Min Req's: MS in Computer Science. Completion of standard 3 hr college courses in both data communication & data base management. Past design & development of UNIX systems software & communication software in PC & mainframe environments using C & C++ & a data base management system. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. #5515379. Ad Paid by an Equal Employment Opportunity Employer.

Senior Computer Software Engineer wanted for technical engineering, consulting on project planning, management, control procedures, setting standards for the entire software development process, review various test plans, review and purchase of software control package and user interface, design, develop and implement software applications for networking and communication requirements using UNISYS A Series including B5000, B6000, B7000, B1900 series hardware, MCP, environmental software products, CANDE, COMS, DMS II, GENCOS, BNA, BNAV2, NDLI, SMFI, ERGO, COBOL 74, ALGOL and FORTRAN. Requires M.S. degree in Physics, Electrical Engineering or Computer Engineering and one year experience in the job offered or one year related experience as a Computer Systems Analyst. \$44,000.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #39589 "Employer Paid Ad".

### SENIOR ANALYST - SYSTEMS SUPPORT

Downtown Chicago transportation company has an immediate opening for a Senior Analyst to assist in the development of computer applications, implement and coordinate our computer training effort and create ad hoc computer queries. The successful candidate will have 2-3 years experience with mainframe and micro computer systems and capabilities. Strong verbal, written, keyboard and computer programming skills are required. The ideal candidate will have a SAS background with a working knowledge of SMART, ASI, OMF, AS or SOL. This position offers challenge, opportunity and an excellent benefits package. Send resume and salary requirements in confidence to:

CW-85178  
Computerworld  
Box 3171  
Framingham, MA 01701-0171  
An Equal Opportunity Employer - M/F

## MANAGER OF APPLICATIONS DEVELOPMENT

Graber Industries, a leading manufacturer of drapery hardware, vertical blinds, horizontal blinds and pleated shades is celebrating its 50th anniversary in 1989. Continued growth has led to the need for an individual to lead our systems and programming group. Responsibilities include: plan, direct and control development, installation and maintenance of applications programs; develop departmental standards and procedures; assign, direct and coordinate the work of 12-15 programmers and analysts; provide leadership and technical support and direction.

Our data processing environment: IBM 4381 mainframe, VM/DOS/VS, IMS data base. Candidates must have a bachelor's or master's degree in computer science, math, MIS or business plus at least 8 years experience in applications development including 3 years as a programming supervisor or project manager.

Graber Industries is a growing division of a Fortune 250 company. We offer a competitive salary and excellent benefits including profit sharing and a challenging and rewarding work environment. Send resume including salary history to:



John Rosenbaum  
GRABER  
INDUSTRIES, INC.  
7549 Graber Road  
Middleton, WI 53562  
Equal Opportunity Employer

## FLORIDA/CARIBBEAN

We Need You:

- \* IMS DB/DC
- \* CICS
- \* IDMS/DBA
- \* ADSS
- \* DB2
- \* PLI/CICS or IMS
- \* ASSEMBLER
- \* MS-DOS/C, DBase
- \* VAX/ORACLE, INGRESS

METRO offers excellent benefits and compensation. STATE-OF-THE-ART PROJECTS. Call Brenda at:

**METRO**  
Information Services, Inc.  
5300 W. Cypress, Ste 285  
Tampa, FL 33607  
(813) 289-6955  
Fax: (813) 289-4855

## ONE COMPANY.

Keane employees enjoy what all technical professionals want. The stability of full-time consulting work. State-of-the-art technologies including fourth-generation languages, databases and productivity tools. The opportunity to apply their application expertise at Fortune 1000 manufacturers, insurance companies, banks, services companies and government agencies. The chance to work for the premier project-oriented consulting company in the industry. Technical, management and project management training. Competitive salaries, comprehensive benefits, 401K plan, tuition reimbursement, and vacation condominiums. For one career offering endless possibilities, consult with Keane.

### PROGRAMMERS/PROGRAMMER ANALYSTS

If you're a computer programmer with 2-5 years' experience in the following areas, we want to hear from you.

IMS	TELON	IDMS
COBOL	ADABAS	VAX
DB2	System 38	CICS
AS 400	FOCUS	WANG

For more information, call Deborah Pawlicki at 1-800-328-4688 or send your resume to her attention at Keane, Inc., 10 City Square, Boston, MA 02129. An equal opportunity employer.



Arlington, VA  
Akron, OH  
Baltimore, MD

## ENDLESS POSSIBILITIES.

Bedford, NH  
Bethlehem, PA  
Boston, MA  
Chicago, IL  
Cleveland, OH  
Endicott, NY  
Hammond, IN  
Hartford, CT  
Kingston, NY  
Melville, NY  
Meriden, CT  
Minneapolis, MN  
New Providence, NJ  
New York, NY  
Philadelphia, PA  
Portland, ME  
Princeton, NJ  
Providence, RI  
Rochester, MN  
Washington, DC  
Wilmington, DE

### A Terrific Opportunity

#### MARKETING REPRESENTATIVE COMPUTER SERVICES

Leading Southeastern Contract Programming Firm is seeking dynamic, experienced marketing representative to work in our home office in Columbia, SC calling on established Fortune 500 Accounts. Candidate should have degree and a minimum of five years professional sales experience. Excellent compensation package includes base salary plus commissions, bonuses and full benefits package. Send resume or call James Eggleston, Vice President/Sales.

#### Computer Consulting Group

Contact Professional Services

Contact Us Today!

One Monckton Blvd.

Monckton, SC 29506

1-800-222-1273

(803) 738-1994

FAX (803) 738-9123

Computer Software Engineer wanted to analyze complex systems requirements; and design and develop manufacturing and government systems on UNISYS large systems (A Series) using DMS II, COMS, COBOL, WPL, manufacturing packages like BAMCS, and structured systems development. Requires B.S. degree in Mechanical Engineering or Computer Engineering and two years experience; \$44,000.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #34689 "Employer Paid Ad".



## Computer Professionals

Sophistication. From our networks to our mainframe systems and applications programming. At American Express, we're providing computer specialists an opportunity to achieve their professional goals in computer technology. We're more than just a well-known name...we're an industry leader with some of the most sophisticated computer opportunities.

### Database Administrators

Candidates must possess good communication skills and be highly knowledgeable about all facets of IMS/VS, DB/DC and/or DB2 design and development. At least 5 years database administration experience is required. Our computer environment includes IBM 3090s, MVS/ESA, TSO, IMS DB/DC and DB2. Send resume to Dept. PT(684).

### Programmer Analysts

A Bachelor's degree or equivalent and at least 3 years experience in design and development of business applications is required. IMS DB/DC or CICS experience is necessary, as is TSO/SPF, JCL and OS/VS utilities. Send resume to Dept. PT(660/605).

### Senior Programmer Analyst

Position requires experience developing major computer systems, TPF problem solving experience in an on-line environment and at least 1 year experience coding BAL is necessary. Knowledge of CMS, TSO, CICS and IMS is required. Send resume to Dept. PT(659).

We provide a comprehensive compensation and benefits package and an opportunity to achieve your professional goals in computer technology. Please send your resume with salary history noting the department code above to: AMERICAN EXPRESS, P.O. Box 53781, Phoenix, AZ 85072-3781.

An Equal Opportunity Employer



## Consulting...

For project variety, keeping abreast of the latest technologies, teamwork, and personal and professional rewards, it's hard to beat a career as a consultant with Analysts International Corporation. AIC is widely acknowledged as one of the best DP consulting firms.

### ...in Minnesota.

Life in the Twin Cities is a pleasure. Clean and friendly, Minneapolis-St. Paul is one of America's largest seats of high technology... with proximity to some of the most beautiful and enjoyable outdoor recreation sites in the Midwest. Outstanding educational and cultural resources abound.

**IBM Mainframe:** COBOL, BAL, PACBASE, CICS, TELON, MANTIS, IMS, IDMS, DB2

**DEC VAX:** COBOL, INGRES

**HP3000:** IMAGE, VIEW, PROTS, POWERHOUSE

**Burroughs A-Series COBOL**

If you have 2+ years experience in ANY of the above areas, we want to hear from you. AIC offers competitive salaries and comprehensive benefits. For consideration call Carol Lee at (612) 835-2330 or 1-800-328-9929, or send your resume to her at: Analysts International Corporation, Department C-229, 7615 Metro Blvd., Minneapolis, MN 55435. Equal Opportunity Employer M/F/H. We prefer to hear directly from candidates.

Atlanta Group Systems Inc. (AGSI) has provided data processing consulting and contracting services nationwide since 1980. We specialize in banking, healthcare, insurance and financial software support. As one of our consultants, you would have the chance to work on both short and long term assignments and enjoy excellent compensation with liberal benefits.

If you are a self-motivated person with experience in any of the following areas, we are looking for you:

DB2, APL, COBOL/CICS, IDMS, UNISYS, IMS DB/DC, AS/400, or Policy Management Systems

For confidential consideration and interview, please call, fax, or mail your resume and salary history to Rex Afford

**AGSI**

ATLANTA GROUP SYSTEMS, INC.  
2971 Powers Rd. South, Ste. 275, Atlanta, GA 30341  
404-455-7785 1-404-788-AGSI FAX # 1-404-451-5163

**CALL OUR NEW AND IMPROVED 24 HOUR ON-LINE CONTRACT AND PERMANENT JOB LISTINGS**

**919-222-0979**

**PLEASE TELL YOUR DP FRIENDS ABOUT IT!**

**DP RESOURCES, INC.**  
P.O. Box 5057  
Burlington, NC 27216-5057

### COMPUTER PROGRESS CORPORATION

\$40,000 to \$60,000

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for Programmers and Analysts in Kentucky, Ohio, Indiana, and Tennessee with one of the following skills:

- IMS/DB/DC • DB2/SQL
- C/38 RPG II • C/C++
- NATURAL • FOCUS
- IDEAL DATA/Commander

Send resume or call: **Computer Progress Corp.**  
12730 Towneplace, Wiley  
Louisville, KY 40243  
(502) 245-8533

Computer Software Engineer wanted to analyze complex systems requirements; design, develop and implement banking and manufacturing applications on UNISYS small, medium and large systems including 9600, 3900, V330 and 1900 using COBOL, DMS II, GEMCOS, UNISYS Document Processing System for banks, 96000, S4000 and UNISYS Item Processing Systems (IPS). Requires B.S. degree in Mechanical Engineering or Computer Engineering and two years experience in this job offered or two years related experience as a Computer Systems Analyst; \$39,000.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202; #38789 "Employer Paid Ad"

### MEMPHIS/MID-SOUTH

Centrally located to National client base. Specializing in the placement of data processing professionals qualified for positions in the \$25-50,000 range. Clients pay our fees, provide relocation and offer great career opportunities.

**ROMAC**  
Professional Recruiters

8000 Poplar Avenue, Suite 340  
Memphis, TN 38119  
901-695-8500 FAX 901-484-1800  
Darlene R. Murphy, Partner

## A Terrific Opportunity

Computer Consulting Group, one of the Southwest's fastest growing contract programming and consulting firms, has immediate openings for talented Programmer/Analysts with 2 or more years' experience. Excellent salary & benefits package. We're especially seeking:

VAX/PORT/MANUP  
ADABAS/NATURAL  
VAX/PC/BAC  
S/A DRAC/ADABAS  
IMB/C  
DEC/ADABAS P/A  
VAX TEL-A-SHAP  
HP 64000/ENGUC  
COBOL/MS P/A  
S/AS/ADSO MANUP  
VAX/FORTRAN  
WANG/COBOL  
Q-CLEARANCE  
DEC/POP/FORTRAN  
VAX/COBOL  
HP TRANSACT  
VAX/VSE  
P.C. SPECIALIST  
PRINTER WRITER (DESI)  
IBM SERIES 1/ESL  
VAX/C/ELN/VSE

### Computer Consulting Group

Contract Professional Services

Research Triangle Area

4109 Wake Forest Rd.

Suite 307

Raleigh, NC 27609

1-800-222-1273

(803) 738-1994

FAX (803) 738-9123

**SYSTEMS ANALYST** wanted. Duties: Participating in the analysis of workmen's compensation systems; data processing requirements and the design, development, customizing and implementation of a computer system which will process the data in the most timely and inexpensive manner. Duties will be performed on an Unisys A series computer using the following software and languages: Communication Management System (COMS), Script Design Facility (SDF), Advance Data Dictionary System (ADDS), COBOL 74, ALGOL, and DMS II. Need Bachelor's in Computer Science or Engineering and 5 mos exp to the job offered. Pay is \$40,000 per year, 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #41389. Employer Paid Ad.

**Assistant Professor**, 40 hours per week, no overtime, 2-10pm Mon-Fri, salary \$37,000 per year. Teaching graduate courses in computer & information sciences; guiding students to do projects in order to fulfill requirements of Master of Science degree; curriculum development; instructional computer laboratory supervision; design and implementation of administrative database system and student records information system; management of computer hardware maintenance. Required to teach in eleven months during the school year. PhD in Computer Science, 8 years of college education. Two years of prior teaching experience or three years of working experience in computer engineering or electrical engineering. Send resume to: Illinois Dept. of Employment Security, 401 South State Street - 3 South, Chicago, IL 60605. Attn: L. Donegan, Ref. #8975-D (An Employer Paid Ad).

### Programmer Analyst

Our client located in northern Alabama has a need for someone with 3-5 yrs exp with VM/CMS, COBOL, and ISPF. SQL or a similar database is a must. To \$45,000 plus living expense. FEE PAID.

**ROBERT HULF**

DATA PROCESSING

1980 Post Oak Blvd.

#1470

Houston, Texas 77066

800/358-1984

Computer Systems Analyst

wanted to analyze complex systems requirements; design, develop and install computer software with special communications applications; develop programs for special machine applications; trouble shoot and maintain existing software; install and train users on specialized applications; and program development. Requires B.S. degree in Computer Science or Mechanical Engineering and one year experience; \$28,200.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #42189 "Employer Paid Ad"

**Software Engineer/Control Systems Development**, 40 hrs/week, \$44,833.00/yr. Design & maintain the high integrity controller, which includes the system processor, programmer's panel handler, & input/output interface processor. Design & maintain the flow chart of the digital assembler using CAD or other specified package to allow direct entry of flow charts. Design ladder control enhancements by implementing analog boiler control blocks. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, 1750 Building, Austin, Texas 78778, J.O. #5424297. Ad Paid by an Equal Employment Opportunity Employer.

### INFORMATION SERVICES MANAGER

The City of Lubbock, Texas (population 158,000) is seeking an individual to direct the operations of a municipal computer information system. This position reports to an Assistant City Manager and supervises approximately 20 professional, clerical staff. Requires: A Bachelors Degree in Computer Science, Math, Information Services, or closely related field; five years of management/supervisory experience; knowledge of OS/MS and MS operating systems; IBM (4300 series) and DEC mainframes; excellent oral and written communication skills. Prefer Masters Degree and municipal management experience in data processing. Salary Range: \$39,355.20 - \$57,854.00. Open Until Filled.

Send a resume, minimum salary requirements, and salary history to: Staffing Coordinator, Personnel Department, P.O. Box 2000, Lubbock, Texas 79457.

### VIRGINIA

Outstanding opportunities for qualified MS Professionals exist in Richmond, VA in a climate, environment and economy among the best in the US.

We are presently recruiting for the following:

- IMS Data Base Analysts
- IMS Data Base Programmers
- CICS Programmer/Analysts
- DB2 Programmer/Analysts
- System RPG II
- Programmer/Analysts

**Don Richard Associates**  
7275 Glen Forest Drive  
Suite 202  
Richmond, VA 23226  
Phone # 804-282-4396  
Fax # 804-282-4792

### It's the efficient way to recruit qualified computer professionals.

Now you can target your recruitment advertising to the qualified computer professionals you want to reach - where you want to reach them. All you need is the new IDG Communications Computer Careers Network. Here's how it can work for you:

You choose the newspapers. Depending on who you're looking for, you can select the combination of five newspapers that best suits your needs - Computerworld, InfoWorld, Network World, Digital News, and Federal Computer Week Editions.

You choose the region. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Of course, national buzz of individual newspapers or various combinations are also available when you need to extend your reach.

To put the new Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you.

Sales Offices: **BOSTON:** 375 Commonwealth Rd., Box 9171, Framingham, MA 01701-9171, (508) 875-0700. **NEW YORK:** Paramount Plaza 1, 140 Route 17 North, Paramus, NJ 07652, (201) 867-1355. **MILWAUKEE:** 5504 Professional Hill Drive, Fairfax, VA 22031, (703) 573-4115. **CHICAGO:** 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 857-8633. **LOS ANGELES:** 1820 S. Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164. **SAN FRANCISCO:** 18008 Skyway Circle, Suite 145, Irvine, CA 92714, (714) 250-0164.

# Every week Computerworld delivers more qualified job candidates than any other newspaper.

That's why more companies place more recruitment advertising in *Computerworld* than in any other specialized business newspaper.

To place your ad, call Lisa McGrath today at 800-343-6474 (in MA, 617-879-0700).



**Weekly. Regional. National. And it works.**

An IDG Communications Publication

MIS Professionals



## GLAXO ENHANCES LIFE FOR MIS PROFESSIONALS

*A leader in the pharmaceutical industry... modern, state-of-the-art high tech facilities... a location that has been ranked as one of the best places to live in the U.S. All of this and more await you at Glaxo Inc.*

As the fastest growing of the Top 5 research-oriented ethical pharmaceutical companies in the U.S., Glaxo Inc. is continually launching new, widely prescribed products that help extend and enhance the lives of millions of people around the world. Success also extends and enhances the professional horizons and personal lives of Glaxo people. The Management Information Services Department at our Corporate Headquarters in Research Triangle Park, N.C. is a prime example of continually enlarging missions, capabilities, and opportunities... and a lifestyle-enhancing location.

### SENIOR END USER COMPUTING CONSULTANT

Individual is needed to augment the Systems Support staff in an integrated PC, workstation and LAN to host computing environment. Candidate will provide assistance in the design, implementation, and support of PC LANs for commercial applications. Background must include 4-8 years data processing experience supporting host and/or PC software to include experience implementing and supporting PC LANs.

A strong working knowledge of SNA Networks in an IBM MVS/XA environment is required. Knowledge of PS/2 hardware, PC DOS, and applications software such as Lotus 1-2-3, dBASE III Plus, Displaywrite 4, and IRMA E78+ is required. We prefer candidates with experience implementing and supporting network applications running on an IBM Token-Ring Network and experience with IBM LAN Manager, PC LAN Program, Network Bridge Program, Trace and Performance Program, Asynchronous Connection Server and OS/2. Programming proficiency in "C" or Basic is also desired.

Our new state-of-the-art Corporate Headquarters facility is located in the world renowned Research Triangle Park (20 minutes from Raleigh, Durham and Chapel Hill). This area, ranked as one of the best places to live in the U.S., is complemented with excellent universities, scenic vistas and a broad spectrum of cultural and recreational adventure that promises you a satisfying quality of life. Equally appealing are Glaxo's highly competitive salaries and excellent benefits including an on-site fitness center.

Candidates interested in this position, please send your resume, including salary history, to:

Human Resources Department  
Job # 3630B925

# Glaxo Inc.

(No Phone Calls, Please)  
No Private Agency Referrals, Please  
An Equal Opportunity Employer M/F/H/V

P.O. Box 13996  
Research Triangle Park, NC 27709

Paving the way to a healthier world.

### SYSTEMS ANALYST/PROGRAMMER

(Work Location: Mercury & Tonopah, Nevada)

These positions require a bachelors's degree in business administration, mathematics, health physics, computer sciences or related fields. Must have two or more years of applicable systems analysis and programming experience, to include COBOL and/or FORTRAN programming on DEC VAX timesharing systems. Relational database experience is preferred. Must be able to communicate effectively with business and health physics people and have solid foundation in structured methods of design and programming.

EQUAL OPPORTUNITY EMPLOYER M/F  
Liberal Fringe Benefits. Replies Held Confidential.  
Must be a U.S. citizen. Drug/alcohol screening test required.

SEND RESUMES TO:

Trudie L. Rainey  
Recruiting & Employment Administrator  
Reynolds Electrical & Engineering Co., Inc.  
Post Office Box 89193  
Las Vegas, NV 89193  
Tel: (702) 295-1900

## LEADING EDGE TECHNOLOGICAL ENVIRONMENT

San Antonio, Texas

Work for the company that...

- Keys 5,200,000 full function IMS transactions daily (7 million projected by 1990)
- Is known for using technology as a strategic weapon
- Assisted in developing an "Image of the Future" for IBM\*
- Has a 4 day work week
- Provides a flexible benefit package
- Works with tomorrow's technology...today

### PRODUCTS & SERVICES:

- Property & Casualty Insurance • Investment Services • Discount Brokerage Services
- Banking Services • Satellite Communications Company • Travel Services • Buying Services
- Life and Health Insurance Annuities

### SENIOR TELECOMMUNICATIONS PLANNER

An immediate opening for the Senior Telecommunications Planner is available with responsibility for helping establish corporate telecommunications strategies for USAA's worldwide voice, data and video communication networks.

Requirements include:

- Minimum of 10 years background in both data processing and telecommunications
- Strong background in IBM Database Applications
- Network management or configuration experience
- PBX configuration, planning or operation
- Telephone management systems (ACD, etc.)
- Integrated Services Digital Network experience or understanding

San Antonio, the 9th largest city, has many amenities to offer... a scenic Riverwalk, the symphony, live theater, fine dining, night life, professional sports, cultural events, as well as 5 major institutions of higher education.

Qualified candidates please send resume to:

USAA  
USAA Building  
San Antonio, Texas 78288  
Attn: Employment & Placement/TLL CW 626

\*As appeared in IBM's full page ad in "The Wall Street Journal", September 23, 1988.  
An Equal Opportunity Employer, M/F. Principals only, please.



### Region Account Manager for Taiwan

Please send resume within 30 days of publication date to:

Employment Security Department  
ES Division  
ATT: JOB # 0135225-J  
Olympia, Washington 98504

**JOB DESCRIPTION:** Divides and coordinates marketing activities of computer software company to market localized U.S.-designed and -produced software for microcomputers and processors in Taiwan. Prepares and implements plans for marketing software products to Taiwan-based software distributors and Original Equipment Manufacturers (OEMs). Works with software engineers to implement design changes in software products for Chinese-speaking market. Represents organization at trade shows, seminars and product presentations in Taiwan.

**REQUIREMENTS:** B.A. or B.S. in Business Administration; Major in Management or Marketing. Six months employment experience as Marketing Manager for computer products company, marketing computer products to Taiwan-based software distributors and OEMs and working with software engineers to implement design changes in software for Chinese-speaking market. Must be able to fluently read, write and speak Chinese (Mandarin and Taiwanese) and English. Must be familiar with current colloquialisms, idioms and jargon of Chinese, particularly as pertains to business usage.

**SALARY:** \$33,500 per annum, 40 hours per week, flex time.

**POSITION LOCATION:** 70% U.S. (Primarily Redmond, Washington); 30% Taiwan.

EOE

### Director Systems Development

Team up with thoroughbreds to bring this eighty member application staff into the 22nd century using DB2, Big Blue technology. Green rolling buccle country surrounds the data center. Fortune company in hot business has shown consistent aggressive growth over the last five years with more to come.

If you are a near-hands-on development project manager or programming manager with a track up from programming and thrive on high performance, call us.

ROMAC & Associates  
100 Presidential Blvd.  
Bala Cynwyd, PA 19004  
(215) 667-7351  
FAX (215) 667-2980



## World Class Opportunities in Columbus, OH and Throughout the US

AGS, a NYNEX Company, is a recognized leader in the design and implementation of applications and systems software. We employ 2000 computer professionals in 33 offices nationwide.

We currently have opportunities in Columbus, OH and in our 33 branch offices nationwide for Data Processing Professionals who are eager to begin a world class career. Immediate opportunities exist for those experienced in a UNIX\* and C environment with any of the following:

- X Windows
- Relational Database
- Communications/Networking

AGS offers outstanding career advancement, competitive salaries and an excellent benefits program including medical and dental coverage, relocation assistance, training, tuition reimbursement, a 401k savings plan and more.

To find out why over 2000 computer professionals consider AGS a "world class" employer, call or send your resume to:

Loree Tisdale  
National Recruiter  
AGS Information Services, Inc.  
1139 Spruce Drive  
Mountainside, NJ 07092

# AGS

A NYNEX Company

An Equal Opportunity Employer M/F/H/V  
\*UNIX is a trademark of AT&T.

Arizona California Colorado Connecticut Delaware  
Florida Georgia Illinois Maryland Massachusetts  
Michigan New Jersey New York North Carolina Ohio  
Pennsylvania Texas



# COMPUTER CAREERS

## COMPUTER SERVICES DIRECTOR

International Organization with headquarters in Washington, D.C. is seeking a highly qualified professional to serve as its Chief of Computer Services. The benefits are generous and include six weeks annual vacation. Candidates must have a Bachelor's degree in Computer Science, Engineering, Mathematics or a related field of study, plus a Master's degree in Computer Science, Business Administration, Management, or a related field of study. The ideal candidate should have twelve years of experience in the application of information processing techniques in the solution of complex problems involving the management of projects implemented on mainframe computers. Four years of experience should be in the management of diverse information processing development projects involving system development as well as hardware and software evaluations. Experience in the international area is highly desirable. Interested individuals should send their resumes with salary requirements to:

Ms. C. Dickson  
Department of Personnel  
525 23rd Street, N.W.  
Washington, D.C. 20037

## MINISTRY OF PLANNING DATA PROCESSING POSITIONS

The Ministry of Planning of the Kingdom of Saudi Arabia is seeking highly experienced, self-motivated individuals to fill the following positions in the Computer Department:

### (1) OPERATIONS & SYSTEM SUPPORT MANAGER

Responsible to lead a qualified staff of operations, maintenance, system programming and database administration.

Requirements are: a college degree in computer science with 8-10 years relevant managerial experience; the last 5 years with IBM mainframe. Good knowledge in operations communications, networks, MVS, TSO/ISPF, and IBM hardware; knowledge in ADABAS, NATURAL and PRE-DICT. Capability in training.

### (2) APPLICATIONS MANAGER

Responsible to lead a qualified staff of system development.

Requirements are: a college degree in computer science with 10-12 years relevant managerial experience; the last 5 years with ADABAS, NATURAL, SAS, COBOL, CICS, FORTRAN, MVS/ISPF, CLIST as well as knowledge in statistical and econometric models. Capability in training.

Compensation and benefits will be based on qualifications and experience. Interested candidates should send their resumes, including salary history, current expectations and three names references within 60 days of this announcement to:

Director, Computer Department  
Ministry of Planning  
P.O. Box 358, Riyadh 11182  
Saudi Arabia

## EXPERIENCED MSA PROGRAMMER ANALYSTS

U-Haul Corporate Headquarters in Phoenix, Arizona offers opportunities for programmer analysts with current experience in MSA's Fixed Assets or Human Resources systems. The successful candidate will be working in an IBM mainframe environment and have a bachelors degree in computer science or a related area.

Explore this unique opportunity to work in a progressive and challenging atmosphere with motivated people. Enjoy the lifestyle of the Southwest.

Send letter of interest with resume and salary history to:



U-Haul International  
Human Resources  
2727 N. Central Ave.  
Phoenix, Arizona 85004

## Data Processing Professionals

Experienced programmers, analysts and project leaders needed for contracts throughout the USA.

PACBASE  
ADABAS/NATURAL  
ALL HONEYWELL-BULL  
STRATUS PL1/COBOL  
WANG/PAGE2  
UNIX  
ORACLE  
VAX/VMS

We offer excellent rates.

Call, Fax or Send resume to:

SBS Scientific &  
Business Systems  
2 Park Avenue  
New York, NY 10016  
(212) 481-1310  
Fax: (212) 481-1319

## Unisys Series 1100 Operating Systems Manager

The Bureau of the Census is seeking an experienced Computer Systems Programmer to fill the position of Operating Systems Branch Chief. The individual must have 8 or more years experience in systems generation, operating systems dump analysis, communications, and fault isolation. Major duties will include the supervision of up to seven systems analysts to support the Census Bureau's four Unisys mainframes. Salary ranges from \$46,592 to \$93,172 per year. If you are interested in applying, send your Application For Federal Employment (SF-171) to:



Bureau of the Census  
Personnel Division  
Room 3253  
ATTN: CQ-CVSD  
Washington, D.C. 20233  
Phone - 1-301-763-7970

An Equal Opportunity  
Employer  
U.S. Citizenship Required

## SOFTWARE DEVELOPERS

As a nationwide placement firm specializing in UNIX system developers, programmers, and software engineers, Innovative Options can help you explore positions throughout the national high tech, R&D community.

Our nationwide clientele and network of affiliates can offer challenging opportunities (without cost to you) in any of the following areas:

- UNIX/C
- VAX
- Applications or Systems Development
- Networking/Telecommunications
- Database Development

Prefer BS, MS, or PhD in Computer Science or EE. No entry level positions available. Send your resume in confidence to:

**INNOVATIVE  
= OPTIONS =**

P.O. Box 21580 • Columbus, OH 43221 • (614) 487-6383  
INNOV is a Trademark of Bell Labs

## MIS DIRECTORS

If you need good people, we've got them. Computerworld reaches more than 612,000 computer pros every week. That's more qualified computer pros than any newspaper can deliver. And you can select either a regional edition or national edition of Computerworld's Computer Careers section for your ad.

For more information, or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

**Weekly,  
Regional,  
National.  
And It  
Works...**



## KENDA SYSTEMS, INC.

Two Manor Parkway  
Salem, N.H. 03079

## CONSULTANTS

MEMBER NACCB

KENDA SYSTEMS provides consultants to the East Coast High Tech Community. Talented professionals with these skills are welcome to register with KENDA SYSTEMS.

NETWORK	VMS/C/Develop DECNET Interface
PORT	UNIX/C/UNIX/Port Point of Sale SW
RADAR	VAX/ADA Modeling and Image Display
PROJECT LEADER	VMS/i)MACRO32/C/Test OS for new CPU
APPLICATIONS	IBM PC/MSDOS/4th Dimension
COMMUNICATIONS	MAC II/C/MACAPP/Object Oriented Design
REAL TIME	VAX/FORTRAN/Data Comm
DATA BASE	IBM MAINFRAME/BAL/-MVS/II/4GL
LINGUISTIC SW	ASIM 2-30/C/Port for Mass Storage Devices
COURSE DEVELOPER	UNIX and Interleaf exp.
TECH WRITER	

Forward resume to Richard Pierce

PHONE: (603) 898-7854

FAX: (603) 898-3703



## KENDA SYSTEMS, INC.

50 E. 42nd Street, Suite 1508  
New York, New York 10017

## CONSULTANTS

MEMBER NACCB

KENDA SYSTEMS provides consultants to the East Coast High Tech Community. Talented professionals with these skills are welcome to register with KENDA SYSTEMS.

- \* MVS/CICS SYS PROG.
- \* 6400 NETWORKING
- \* IMS COBOL or BAL
- \* ADA
- \* SUN SYSTEMS OR COMM
- \* TANDEM PATHWAYS
- \* PL/1/IMS/CICS
- \* XA or ESA or CICS Syst Progs
- \* NOMAD or SAS/Pharm
- \* COBOL II Conversion
- \* STRATUS/C or PL/1

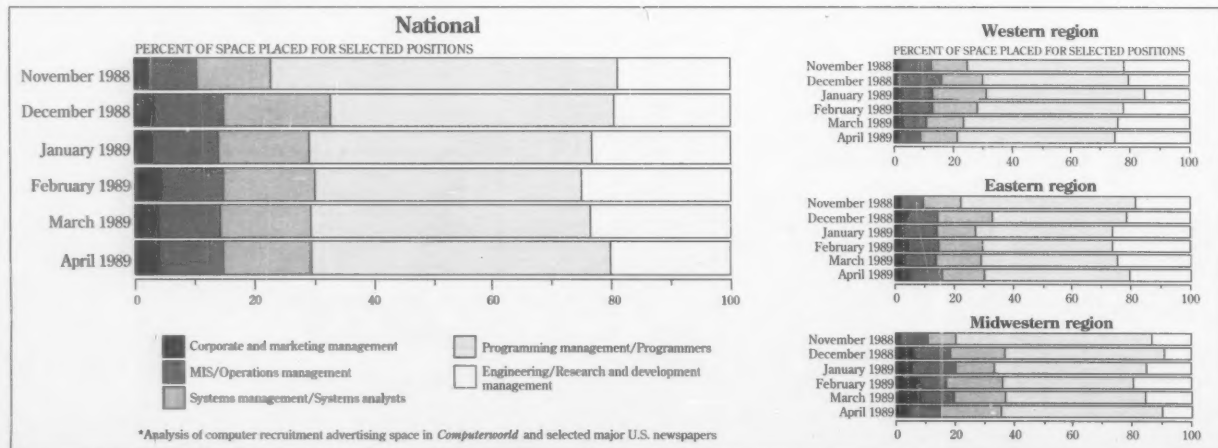
Forward resume to Roz McKinnon.

PHONE: (212) 599-6969

FAX: (212) 599-7891

# CAREER INDEX

## Computer recruitment advertising activity\*



SOURCE: CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATABASE

CW CHART: FRANK C. O'CONNELL





## CAPACITY PLANNING, CICS SYSTEMS PROGRAMMING AND VAX/VMS SYSTEMS PROGRAMMING

Richmond, Virginia

Join the many who consider Philip Morris an excellent environment to expand their technical and interpersonal skills. Our state-of-the-art data processing centers provide us with the superior technology platform that we need to keep pace with continuous growth and profitability. As the nation's largest consumer products company, Philip Morris has achieved a quality and a profitability that other companies respect and few can match.

Currently, Philip Morris U.S.A. is expanding its large scale IBM data center (MVS/XA) and DEC data center, and is seeking to augment its Technical Systems staff. If you are an individual who desires a highly visible, senior position responsible for capacity and architectural planning for IBM mainframe CPUs and I/O subsystems, then you may find your destiny as a key player in our Resource Management group. If your "thing" is systems programming support for large CICS MRO-based online systems, then you may want to join our Host Online Systems group. If your heart is set on the technical support of Microvax networks and clustered DEC processors using relational databases, then consider our Distributed Systems and Communications team.

Each position requires a proven track record, excellent technical and communication skills, and a B.S. degree or the equivalent.

At Philip Morris, your career path is highly flexible and your performance will set the pace. Excellent salaries and generous company benefits will compensate the special skills that you offer. Please send your resume and salary history to: F.X. Gilbride, Dept. #4489, PHILIP MORRIS U.S.A., P.O. Box 26603, Richmond, VA 23261.

Philip Morris U.S.A. is an Equal Opportunity/Affirmative Action Employer and encourages minority and female applicants to apply.

**Philip Morris U.S.A.**

**SYSTEM SUPPORT ENGINEER:** Provide technical customer support for Microcontroller System Serial Control Bus (IEEE P1118 Standard) and real-time operating systems on microcomputers and embedded microcontroller systems. Responsibilities include isolating product hardware and software problems; isolating customer application software problems; reporting product problems to development groups; verifying and providing workarounds to customers utilizing assembly and high level languages; generating and maintaining technical problem information publications for customers; generating delivering technical training on new products and acting as an interface between field, engineering and marketing groups. University level courses or experience to include DOS and UNIX operating systems, microprocessor (8086 family) and microcontroller programming; computer networks assembly language and high level language (C language on 8086 family); computer architecture and software engineering. MS Computer Science or equiv. \$27,100/mo. Job Site: Hillsboro, OR. Clip this ad and send with resume to Employment Division; Attn: Job Order No. 2248670, 675 Union Street N.E., Room 201, Salem, Oregon 97311. UNIX is a TM of AT&T.

**Systems Analyst:** 40 hrs/wk; \$800 am - 5:00 pm; \$30,360/yr; overtime as needed, not compensated. Job requires Masters degree in Computer Science. Job also requires: 1) 1 grad crse. in data base management systems; 2) 2 grad crses. in data structures; 3) 1 grad crse. in which COBOL or RPG computer language was studied; 4) 1 college crse. in computer organization. Job duties: analysis, design, develop, & implement computer systems for a variety of medical billing projects. Convert existing client systems to make compatible with in-house system. Develop software for specific client's needs. Troubleshoot problems with system as they arise. Job requires use of Hewlett-Packard and 3000 computer, COBOL, RPG, & PROLOG computer languages. Qualified applicants should send resume & verification of reqs. to 7310 Woodward, Rm. 415, Detroit, MI 48202. Ref #37989. Employer Paid Ad.

## PL/I...PL/I...PL/I PROGRAMMER/ANALYST

Omaha Steaks International has an immediate opening for a full time Programmer/Analyst, designing and developing applications on a System 38 using PL/I. This position requires a BS degree in Computer Science, applied Math, MIS or related field plus 2-4 years experience in application development on a System 38 or AS400. Candidates should also be proficient with RPGIII, CL, SDA and DDS. No prior PL/I experience is required.

OSI offers an excellent compensation and benefits package! Please send resume to:

8420 West Dodge Rd. Suite 102  
Omaha, NE 68114  
or call: (402) 392-8117

**Omaha Steaks  
International**

An Equal Opportunity Employer

## NATIONWIDE OPPORTUNITIES SOFTWARE/HARDWARE ENGINEER DESIGNERS, ANALYSTS, PROGRAMMERS

Graphics, CASE, Communications, C31, RADAR Operating Systems, Compilers, Kernals, Parallel Processing, UNIX/C, ADA, VAX/VMS, MVS, DB2/SQL, IMS DB/DC, IDMS/ADSO, INGRES, ADABAS/NATURAL, M204/USER, FOCUS, SAS, COBOL/CIS, AS400/RPGIII

**THE LESLIE CORPORATION**  
400 E North Belt #701  
Houston, TX 77060

Call (713) 591-0915 or FAX (713) 591-0921

## SYSTEMS AND PROGRAMMING MANAGER

The City of Richmond is seeking a qualified professional to lead its Bureau of Systems and Programming. The City has embarked upon a long-term plan to improve its business operations, of which systems development is a critical element. The current Information Technology environment includes an IBM 3090X mainframe (MVS/XA), a large portfolio of batch and online (CICS) systems, fourth generation languages (e.g., Intellect), Data General Office Automation, a substantial terminal network, and distributed processing on mini and microcomputers. A continued development/question of large application systems is planned, with possible migration to data base technologies and higher level language. The selected candidate must demonstrate a comprehensive knowledge of the systems development process, including programming, systems design, quality control, and the ability to lead a multi-faceted organization; must possess a broad technical management background, backed up by performance. Information experience with telecommunication is a plus. Requires completion of the core curriculum for a Baccalaureate level major in Computer Science/Mathematics, Business Administration or related field and five years experience in Computer Systems Analysis and design including three years in a managerial or supervisory capacity, or an equivalency. Salary range \$38,974 - \$55,068 annually, depending upon qualifications and experience. Selected applicant must establish City residency within six months of initial appointment. Females/minorities are encouraged to apply. Applications accepted until position is filled.

**OPERATIONS RESEARCH ENGINEER** required. Design and development of mathematical programming, network optimization algorithms and mathematical models in aircraft operations area. Conducts mathematical analysis of management and operational problems using deterministic and probabilistic operations research techniques such as linear and integer programming, inventory control, queueing theory, sequencing and scheduling, and stochastic modeling. Must conceptualize and define problem and formulate mathematical or other model suitable for computer solution. Must prepare reports for submission to management and recommend the appropriate solutions.

Applicants required to have a Masters of Science Degree in Operations Research at least one year prior experience in the design and creation of mathematical optimization algorithms and operational computer simulation models, including some experience with civilian transportation systems.

An annual salary of \$35,000 will be paid for a 40 hour work week. An additional salary may be paid up to \$42,000.00 for additional education and/or experience.

Interested applicants apply at the Dallas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J.O. number 5424298. This advertisement was paid by an Equal Opportunity Employer.

## ATLANTA SOUTHEAST (404) 447-8773

Contract or Permanent Employment Available  
Top Rates and Salaries

**BRANNON & TULLY**

our software development team are making offers now

DB2 IMS CICS ADABAS AS400 S38 RPG COBOL TALENT DEC BANKING

BRANNON & TULLY, INC.  
3169 Holcomb Bl. Rm. #75  
Norcross, GA 30071  
(404) 447-8773

**SOFTWARE ENGINEER** - Interrupt driven, real-time control & multiple application device drivers & hardware/software interfacing. Design software for manual & computer controlled operation, application, & display functions for use in electronic test instrumentation, such as digital pattern generators, pulse generators & low noise power supplies. \$3,250/mo. BS in CSEE plus 2 yrs. exp. req'd. Must have 2 yrs. exp in "C" Assembly language programming for the Intel 8086 family of microprocessors & writing software based on existing hardware designs. Job site & interview in Torrance. Send ad & resume to 1234 Francisco St., Torrance, CA 90502.

## CAREER CHALLENGE = CAREER FULFILLMENT WITH HEALTH SYSTEMS GROUP OF AMERICAN EXPRESS INFORMATION SERVICES COMPANY (ISC)

Find success in the progressive and dynamic environment at American Express' newest operating unit-American Express Information Services Company (ISC). Our Health Systems Group is committed to providing high-quality integrated information processing and communications services. If you're a highly motivated professional, take the time now to examine these opportunities in our rapidly expanding Group.

### SPECIALIST SYSTEMS PROGRAMMER

The successful candidate will be responsible for software development and maintenance of host online systems, access methods and generalized subroutines. Ideal qualifications include a BS in Computer Science and/or experience, plus 5 years systems experience in MVS/XA and Assembler language programming, knowledge of access methods including VSAM. A working knowledge of CICS and IBM online systems would be an asset.

### SPECIALIST SYSTEMS PROGRAMMER

The successful candidate will be responsible for the support and maintenance of MVS/XA and/or VM/XA operating systems and associated program products. Ideal qualifications include a BS in Computer Science plus a minimum of 3 years experience supporting and maintaining VM and MVS. Experience with JES2, PROFS, program products and/or software development would be an asset.

### PROGRAMMER/ANALYST

This position requires a college degree or equivalent work experience, plus minimum 2 years experience in COBOL programming, with working knowledge of IBM PC, PC DOS and Utilities, good system and problem solving skills. Knowledge of LAN, Novell operating systems, programming skills in C, Assembler and Basic, plus Medical Records hospital application knowledge are highly desired.

Our excellent salary/benefits packages are fully reflective of your knowledge, skills and experience. For confidential consideration, send your resume to:

AMERICAN EXPRESS  
INFORMATION  
SERVICES



AMERICAN EXPRESS  
HEALTH SYSTEMS GROUP  
600 McDonnell Blvd.  
Bldg. 280  
Hazelwood, MO 63042

Equal Opportunity Employer

Health Systems Group

## INFORMATION ENGINEERING CONSULTANTS

Covia, a modern partnership of major airlines, is a company fueled by creativity. We're building on a platform of new technologies that have redefined information technology. Starting with our advanced distributed architecture/P52 environment, continuing with the use of Information Engineering Methodology. At Covia, it's happening now, not soon.

Our senior management has committed to utilizing the Information Engineering Methodology. This is not a pilot program. We have multiple projects targeted and underway. We now seek experienced Information Engineering professionals who will function as consultants assisting in the rollout of the I.E. methodology, and lending expertise and guidance on current and future projects. Currently we are utilizing Knowledgeware's IEW Case tool to facilitate implementation.

Your background will include 2 plus years of Information Engineering Methodology, project lead or senior level systems design experience, and a B.S. or B.A. degree in Computer Science or Business Administration. Experience with IEW a plus.

Join us in an environment made for talent like yours. And bring your ideas with you. We didn't develop one of the world's largest private networks with somebody else's innovations. To learn about our benefits, which include air travel privileges, forward your resume to: Covia Corporation, Professional Employment-EXOEI, Dept. CW06-051, P.O. Box 66949, Chicago, IL 60666. Equal Opportunity Employer. Principals Only.

Imagine That!

**COVIA**

# COMPUTER CAREERS

PENNSTATE



## ASSISTANT DIRECTOR THE CENTER FOR ACADEMIC COMPUTING COMPUTER BASED EDUCATIONAL LABORATORY (CBEL)

The Pennsylvania State University invites applications and nominations for the position of Assistant Director of the Center for Academic Computing for The Computer Based Education Laboratory. This position, reporting to the Director of the Center for Academic Computing, is responsible for providing support to the University in the development of computer based instruction initiatives.

The Computer Based Education Laboratory, with a professional staff of three instructional designers and four programmers, works directly with a faculty of 4,300 in achieving benefits afforded through the utilization of computer technologies in the classroom. Assistance ranges from locating, acquiring, testing, and demonstrating suitable software for a particular instructional requirement to designing, implementing and documenting a new computer based offering to fill a unique need. Collaborative efforts utilizing a faculty member and a professional team of CBEL employees are used to develop significant computer based educational packages.

The successful candidate will be responsible for planning, initiating, and leading the development of strategic computer based education services designed to meet the needs of a large geographically-dispersed academic community. Duties of the Assistant Director include providing planning and policy direction for the administrative supervision of the Laboratory's educational support services, coordinating educational software needs with representatives of academic programs, developing standards for instructional software implementation, maintaining a favorable visibility of the University within national organizations addressing computer based educational issues, and fostering the integration of new technologies into the educational environment.

Applicants must have a Doctorate degree or equivalent in Computer Science, Management Information Systems, Instructional Design, or related field plus six years of effective management experience in an academic environment. Experience in instructional software design and development at an institution of higher education is required, along with budgeting, planning and supervising experience. Preference will be given to those candidates possessing a Doctorate degree.

Salary is negotiable and competitive. Starting date is negotiable, but preferably before November 30, 1989. Submit letter of application, current resume and salary requirements to:

Office of Human Resources  
The Pennsylvania State University  
Department W-055, Rider Building  
120 South Burrows Street  
State College, PA 16801

Those applications received by August 4, 1989 will receive full consideration. Those received after that date may be considered if received before the final recommendation is submitted.

An Equal Opportunity/Affirmative Action Employer  
Women and Minorities are Encouraged to Apply

## Data Processing Professionals

Consulting may be the right move for you.

Your next career move can give you greater technical diversification, a better grip on continuing career progress, more responsibility and significantly better compensation.

We're Global Computer Corporation, a data processing consulting firm with current opportunities to enhance your career. We're recruiting data processing pros who are interested in consulting and who have solid programming capabilities in one of the following areas:

- Cobol/CICS or IMS DB/DC
- DB2 or RELATIONAL DATABASE
- TOTAL, DL/I
- DOS/VSE, OS/MVS
- DEC/VAX
- Limited contract and entry-level positions available

If you're ready to discuss the professional and financial advantages of a consulting career, send your resume in confidence to Bob Parsons, Global Computer Corporation, Technical Support Services, 1500 Chiquita Center, 250 East Fifth Street, Cincinnati, Ohio 45202. (No agencies please).



GLOBAL COMPUTER CORPORATION  
(513) 762-7880



## YOUR SYSTEM HAD A Q.A. REVIEW? DOES YOUR CAREER GET THE SAME CONSIDERATION?

A successful career requires sophisticated skills, strategic planning and precision implementation. Do you have any of these skills?

UNIX C VAX TANDEM CICS DB2 IDMS  
Our professional service can provide the rest.

### THE SEARCH FIRM, INC.

595 MARKET STREET, SUITE 1400, SAN FRANCISCO, CA 94105  
(415) 777-3900 FAX 777-8632

## DATA PROCESSING COMPUTER PRINTING SYSTEM

### PAGE PRINTING ADMINISTRATOR

Greater Kansas City laboratory seeking an individual with 2-4 years experience with computer controlled, high volume, Page Printing System.

Skills must include forms design, image processing, font design, job setup and scheduling, troubleshooting, and establishing relationships with vendors. Oral and written communication skills are essential.

Applicant will be working with end-users in designing new applications. Knowledge of Honeywell/Bull DPS/PPS printing systems is beneficial. Excellent benefits. Relocation assistance available.

Send resume. Must include salary requirements.

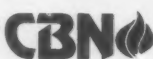
### HOME OFFICE REFERENCE LABORATORY

Personal Employment Office  
P.O. Box 2035  
Shawnee Mission, KS 66201  
EOE

### DATA BASE ADMINISTRATOR

The Christian Broadcasting Network needs a take-charge person to lead our dedicated staff. Work with our IDMS Mainframe Systems to support this worldwide ministry. Your work will mean something. This position requires a BA in computer science, math or related field and experience with DBA work, specifically IDMS. We offer good benefits, smoke-free environment and great folks to work with in a resort city. Send your resume to:

CBN  
Employment Department  
CBN Center, Box 12  
Virginia Beach, VA 23463



Recruit qualified computer and communications professionals with the IDG Communications Computer Careers Network of five leading computer newspapers.

Call Lisa McGrath at:  
(800) 343-6474  
for more details.

# It's the efficient way to recruit qualified computer professionals.

Now you can target your recruitment advertising to the qualified computer professionals you want to reach - where you want to reach them. All you need is the new IDG Communications Computer Careers Network. Here's how it can work for you:

**You choose the newspapers.** Depending on who you're looking for, you can select the combination of five newspapers that best suits your needs - **Computerworld**, **InfoWorld**, **Network World**, **Digital News**, and **Federal Computer Week** Editions.

**You choose the region.** If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Of course, national buys of individual newspapers or various combinations are also available when you need to extend your reach.

**You don't pay for readers you don't want.** Gone are the days when you have to worry about paying for waste circulation. The Computer Careers Network puts you in touch with qualified computer professionals - and only those qualified computer professionals you need to reach.

To put the new Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you. Or contact John Corrigan, Classified Advertising Director, at (508) 879-0700.

### Sales Offices:

**BOSTON:** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (508) 879-0700;

**NEW YORK:** Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350;

**WASHINGTON:** 8304 Professional Hill Drive, Fairfax, VA 22031, (703) 573-4115

**CHICAGO:** 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433;

**LOS ANGELES:** 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164;

**SAN FRANCISCO:** 18008 Sky Park Circle, Suite 145, Irvine, CA 92714, (714) 250-0164;

## DATA MODELERS

### Florida Location

As the leading supplier of marketing research information on television and VCR viewing habits, you will be challenged to provide state-of-the-art systems for our applications development environment.

Responsibilities include analyzing, planning, designing, implementing, and maintaining databases utilizing information engineering and data modeling techniques.

### THE REQUIREMENTS:

Ideal candidates will have a Bachelor's Degree in Engineering, Computer Science, Math or related discipline and 4 years or more experience in:

- Formal, Logical Data Modeling
- Data Driven Design Using ANSI 3-SCHEMA Architecture
- Use of CASE Tools
- Working in a Relational DBMS Environment

We offer a salary commensurate with experience, comprehensive benefits, West Central Florida location, no state income taxes, and a dynamic work environment.

For immediate consideration, please submit resume/letter including salary history, in confidence to: **NIELSEN MEDIA RESEARCH, Human Resources, Dept. CW620, 375 Patricia Avenue, Dunedin, FL 34698.** An equal opportunity employer m/f/v/h.

Nielsen Media Research

A subsidiary of  
The Data Resources Corporation

# MARKETPLACE

## Bread, milk . . . and a LAN

Everyone wants to be a VAR in the industry's fastest growing segment

BY KATY GURLEY  
SPECIAL TO CW

Increased interest in local-area networks, one of the fastest growing segments of the computer industry, has been accompanied by a proliferation of LAN resellers, complicating the purchasing process for users.

Network manufacturers shipped \$3.3 billion worth of LAN hardware and software in 1988 and should deliver \$5 billion worth in 1990, according to International Data Corp., a Framingham, Mass., market research firm. Meanwhile, IDC says, the number of so-called value-added resellers (VAR) that specialize in LANs has grown to 2,300 from 1,800 two years ago.

Several LAN manufacturers, including industry leader Novell, Inc., have said in the past year that they expect to derive the bulk of their sales from reseller and OEM channels. Carol Kenney, reseller programs specialist at LAN vendor Banyan Systems, Inc. in Westboro, Mass., says most of her company's resellers are LAN specialists. "We don't specifically look for specialists," she adds, noting the growth in their number.

The burgeoning ranks of LAN resellers does not neces-

sarily bode well for users, however. David Brown, an independent VAR in Chicago, questions the professionalism of a rival firm in Alabama that he says sells trailer hitches along with LANs. It seems the company began selling personal computers along with the hitches and then started selling LANs after a customer asked for one. "There are three kinds of LAN resellers out there — good, bad and worse," another reseller grumbles.

Adding to the confusion, a variety of other distributors are jockeying with LAN VARs for a piece of the action in reselling LAN hardware and software. This includes retailers, smaller systems integration firms and general-purpose VARs, according to analysts, resellers and users. Additionally, consultants have started advising users on the purchase of a LAN.

Some resellers only sell and install LANs. Others offer networking support, and still others promise to take users from design through maintenance. With the variety of LAN distributors and the rapid growth in their number, users should take the time to determine what type of outlet is right for them and identify a reputable dealer, experts say.

An alternative is to bypass resellers by buying directly from the manufacturer. The big catch here, however, is that many of the network makers will refer all but the cream of big-spending customers to their resellers.

Firms with fewer than 100

**D**AVID BROWN, an independent VAR in Chicago, questions the professionalism of a rival firm in Alabama that he says sells trailer hitches along with LANs.

employees and a handful of PCs are likely to buy LANs from either a retailer such as Computerland Corp. or a LAN VAR.

For medium-to-large companies, the choice is likely to be among VARs, some of which specialize in LANs, and smaller systems integrators, analysts and resellers say. VARs sell standardized systems, including hardware and application software, often targeting specific industries. Systems integrators, which may sell LANs but generally deal in larger systems, provide one-stop shopping, selecting hardware and software from various sources.

In choosing a reseller, devel-

op a plan, advises Scott Miller, network systems administrator at Murata Erie NA, Inc., an electronic components manufacturer in Smyrna, Ga. Miller suggests forming a committee to determine the questions to ask, as his company did. "Our primary concern turned out to be support," he says.

Also, ask about costs up front and remember that you are likely to get only what you pay for: Be prepared to pay more for

• Figure out how important support and maintenance are compared with assistance in determining which products to buy. Some VARs deal with a limited product line and emphasize after-sale service and support, while others do the opposite.

• Don't rule out using more than one company; perhaps a specialized LAN VAR, to help choose and install the right network and a larger one for ongoing service and support.

• Interview several candidates; some resellers offer free initial consultations.

• Be cautious about new companies. "You want to make sure they'll be in business down the road," one reseller says.

• Talk to past customers to determine the reseller's integrity and level of expertise.

Gurley is a Wellesley, Mass.-based freelance writer specializing in high technology.

### Index

<b>Marketplace</b> .....	111
Buy/Sell/Swap .....	111
Software .....	114
Hardware .....	115
Peripherals/Supplies .....	114
Graphics/Desktop Pub .....	115
Bid Proposals/Real Estate .....	114
Time/Services .....	115
<b>Training</b> .....	116

### The BoCoEx index on used computers

Closing prices report for the week ending June 16, 1989

	Closing price	Recent high	Recent low
IBM PC Model 076	\$475	\$625	\$400
XT Model 086	\$850	\$1,150	\$850
XT Model 089	\$1,175	\$1,400	\$950
AT Model 099	\$1,725	\$1,850	\$1,500
AT Model 239	\$1,800	\$2,100	\$1,775
AT Model 339	\$1,925	\$2,000	\$1,800
PS/2 Model 50	\$1,900	\$2,400	\$1,825
PS/2 Model 60	\$3,075	\$3,100	\$2,500
Compaq Portable I	\$600	\$750	\$325
Portable II	\$1,700	\$2,100	\$1,700
Portable III	\$2,875	\$2,950	\$2,200
Portable 286	\$1,800	\$2,000	\$1,675
Plus	\$925	\$1,200	\$900
Deskpro 286	\$1,900	\$2,350	\$1,800
Deskpro 386	\$2,625	\$2,900	\$2,500
Apple Macintosh 512	\$575	\$650	\$300
512E	\$675	\$975	\$600
Plus	\$950	\$1,150	\$750
II	\$3,625	\$4,175	\$3,425
Toshiba 1100+	\$825	\$900	\$725
NEC 286 Multispeed	\$1,925	\$2,050	\$1,900

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

### Buy/Sell/Swap

#### PRIME

EXPERIENCED  
SYSTEMS AND  
PERIPHERALS

BUY-SELL-LEASE-BROKERAGE

NEW PLUG-COMPATIBLE  
DISK, TAPE, MEMORY

PLUS  
THE FASTEST I/O  
AVAILABLE ANYWHERE

1ST SOLUTIONS, INC  
11480 N CAVE CREEK ROAD  
PHOENIX, AZ 85020  
602-997-0997  
ASK FOR DON SHIFRIS

#### DATA GENERAL

BUY-SELL-TRADE

SYSTEMS, PERIPHERALS, OPTIONS,  
TERMINALS AND PARTS

DATA INVESTORS  
CORP.

4 WEST 16 STREET  
NEW YORK, NY 10011

212-675-1000  
FAX 212-645-4539

#### IBM SPECIALISTS

SELL • LEASE • BUY  
S/34 S/36 S/38 AS/400  
3741 3742

- New and Used
- IBM Maintenance Guaranteed
- All Peripherals
- Immediate Delivery
- Upgrades and Features
- Completely Refurbished

800-251-2670

IN TENNESSEE (615) 847-4031

CMC  
COMPUTER MARKETING  
of America, Inc.

PO BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

We Buy & Sell

DEC

Systems  
Components

Digital  
Computer  
Resale  
call: 713  
445-0082  
600 Kendrick Ste C22  
Houston, TX 77060

Buy IBM Sell

36 38 4300

DISPLAYWRITERS

DEC

WANG

XEROX

Printers • Terminals • Disk's  
LRK RESOURCES  
UNLTD INC.

713-437-7379  
FAX 713 437-4945 800-523-8903



# CLASSIFIED

## Buy/Sell/Swap

**IBM**  
SYSTEM 36/38  
SYSTEM AS/400  
4300

• Lease • Trade

MEMBER OF WGL

**SERIES 1**

**SPECIAL LEASE RATES ON NEW AS/400's**  
• Buy • Sell • New • Used

**NEWPORT LEASING, INC.**  
800-6789-IBM  
2 Faraday, Irvine, CA 92718  
714/770-2122/FAX: 714/770-5441

**BUY OR SELL  
NEW OR USED**

IBM PC \* XT \* AT \* PS/2  
COMPAQ \* HP \* AT&T \* WANG  
MACINTOSH \* APPLE 2

1-800-262-6399

**Boston  
Computer  
Exchange  
Corporation**  
MA 617-542-4414  
FAX 617-542-8849

**IBM**  
BUY • SELL • LEASE

**WE RENT  
AS/400's**

SHORT OR LONG TERM  
S/1 S/3X  
PARTS POS

**AMCOM**  
CORPORATION  
800-328-7723  
612-829-7445  
5555 WEST 78TH STREET  
MINNEAPOLIS, MN 55435

*Distinctive  
Dataprocessing*

**For Sale or Lease  
DEC  
"8650"  
(865XB-AE)**

plus all supporting peripherals

Call  
(214) 869-2214  
FAX: 214-869-1589

11419 Mathis, Ste 210, Dallas, TX 75234

**DEC VAX & AT&T  
BUY-SELL-NEW-USED**

Systems, Peripherals, Options  
available for sale

Looking to purchase VAX  
and AT&T Systems, Hardware

**LAKEWOOD COMPUTER  
CORP.**  
436 Lark Lane  
Ft. Collins, CO 80504  
(303) 493-6406 FAX: (303) 493-6409

**BUY • SELL • RENT • LEASE  
MEMOREX • TELEX**

TERMINALS • PRINTERS  
CONTROLLERS

MODELS: 078, 079, 178, 179,  
275, 277, 278, 287D2, 387

CALL: PETE DOCKTER  
**LEASING ASSOC. CORP.**  
ONE CIRCLE WEST  
STAMFORD, CT 06902  
(203) 978-1400

**BUY-SELL-LEASE  
IBM**

43XX  
3380 DASD  
3480 TAPES

Immediate Delivery  
Warranted to Qualify  
for Manufacturer's  
Maintenance

**GLOBAL  
COMPUTER  
CORPORATION**  
4620 Sunbelt Drive  
Dallas, Texas 75248-1833  
214/931-3083  
FAX 214/931-8562

**IBM Unit Record  
Equipment**

Data Modules/Disk Packs  
Magnetic Tape/Diskettes

029-082-083-084-085-086  
129-514-519-548-557-188

2316-3336(1)&(11)-3348(70)  
80-200-300 MB  
Disk Packs

**Thomas Computer Corp.**  
5636 W. Howard Chicago IL 60648  
800-621-3906 312-647-0880

**IF YOU'RE BUYING, WE'RE SELLING**

36  
38  
4300

**IF YOU'RE SELLING, WE'RE BUYING**

IBM SYSTEMS  
Buy • Sell • Lease PERIPHERALS

(800) 331-8283  
TOLL FREE

(213) 394-1561  
CALIFORNIA

**Ocean Computers, Inc.**  
919 Santa Monica Blvd., Ste. 200  
Santa Monica, CA 90401

**MAI**  
Complete system

**BASIC 4**

MPx  
9520

8 MB MEMORY  
300MB FIXED DISKS  
GCR TAPE DRIVE (6250)

**PERIPHERALS!**  
1 DAY SHIPMENT  
SALE or LEASE!

617-267-8600  
FOR SALE BY OWNER

**We Buy, Sell,  
Lease & Rent  
New & Used**

**AS/400  
SYS/3X MICROs**  
SYSTEMS-PERIPHERALS-UPGRADES

**COMPATIBLES**  
I/O-MEMOREX-EMERALD  
GENCOM-ANZAC-QDECK

• IBM warranty/maint. guarantee  
• Lowest prices/fast reliable service  
• Highest trade-in allowances

**U.S.A.**

**Your Best Deal Source!**  
**UNICOM SALES ASSOC., INC.**  
67 Walnut Ave. Clark, NJ 07066  
800-USA-9406  
In NJ 201-381-6390  
FAX: 201-381-6373

**DEC-IBM  
BUY / SELL**

VAXs  
MICROVAX II, III SYSTEMS  
IBM S/36, S/38, 43XX, 30XX,  
AS400 • PERIPHERALS  
IBM XT, AT, PS/2  
ALL MICROS  
IBM AT 339s (New & Refurb)  
IBM 3174 51Rs (New & Refurb)  
ALL KEY, PBX & Telecom EQPT.

**LINK PROCESSOR**  
603 E. Town St.  
Columbus, OH 43215  
Phone: 614-464-1638  
FAX: 614-464-3409

**BUY & SELL  
DATA GENERAL**

Desktop to MV's  
Systems - Upgrades - Options

**WANTED - USED MV's**

**AMES SCIENCES, INC.**  
(301) 476-3200  
FAX: (301) 476-3396

**Associates Inc.**

• Data General • Fujitsu  
• Data Products • CDC  
• Printronix • Zetaco

**BUY SELL TRADE**

(617) 952-9864  
FAX: (617) 871-4456

**BURROUGHS  
UNISYS**  
B20 - B7000

A Series - V Series  
All Peripherals

**Low Lease Rates**  
**Depot Maintenance**

LDI/  
COMPUTER PROVISIONS  
CORPORATION  
(216) 687-0307

**DEC POP-11**  
SYSTEMS & PERIPHERALS

**THE  
One-Stop  
EXCHANGE!**  
• CPUs • TERMINALS  
• DISC DRIVES • PRINTERS  
• INTERFACES, ETC.

**DCE DIGITAL  
COMPUTER  
EXCHANGE INC.**  
27773 Industrial Blvd., Hayward, CA 94543  
FAX (415) 887-0880 TLX 708630

Call (415) 887-3100

**Computerworld's  
Classified  
Marketplace**

*showcases your ad  
by product category!*

Whether it's used equipment,  
software, time, services or just  
about any other category of  
computer product or service,  
Computerworld's Classified Market-  
place is organized to make  
your ad visible and to make buy-  
ing your product easy.

**Just look!**

**Computerworld's  
Classified Marketplace  
Product Categories**

buy/sell/swap  
hardware  
software  
communications  
graphics/desktop/  
publishing  
time/services  
bids/proposals/  
real estate  
business opportunities

So if you're selling computer  
products or services, adver-  
tise in the newspaper that  
showcases YOUR product or  
service. Advertise in Compu-  
terworld's Classified Market-  
place!

For more  
information, call:  
**800/343-6474**  
(in MA, 508/879-0700).

Buy/Sell/Swap

**HP 3000**

ATP's • S/70  
7937H • 7933H

Available in Quantity  
Processors • Peripherals  
Systems

All In Stock - Immediate Delivery

All warranted to qualify for  
manufacturer's maintenance

BUY • SELL • TRADE  
RENT • LEASE

ConAm Corporation

It's Performance That Counts!  
800/643-4954 213/829-2277

**NORTHEAST MINICOMPUTER, INC.**

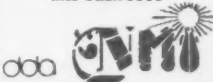
55 High Street, Unit 6  
Billerica, MA 01862

Wants to Buy Your Surplus  
DEC Computer Equipment

We Pay Cash for Your  
Unwanted Computer,  
Peripherals, Options,  
Memory, and Terminals.

Call 1-800-343-8302  
or in Mass.  
1-508-663-2550.  
Or Fax Your List  
1-508-667-0718

Turn your excess inventory  
into cash \$\$\$\$



**IBM**

BUY • SELL • LEASE

CDP

SYSTEM  
36/38

43XX  
30XX

AS/400

AT&T  
VOICE  
SYSTEMS

SERIES  
1

- Processors
- Peripherals
- Upgrades

**DEMPSLEY**

ASSOCIATES

18377 Beach Blvd., Suite 323  
Huntington Beach, CA 92648 (714) 847-8486

(800) 888-2000

**RT**

937X

Series/1

AS/400

System 36, 38  
4300

Buy, Sell, Lease, Rent

612-942-9830

All IBM Machines and Parts

**DATATREND**

10250 Valley View Road  
Suite 149  
Eden Prairie, Minnesota 55434

**HEWLETT • PACKARD**

1000 • 3000  
9000

Computers • Peripherals  
Terminals

Buy • Sell • Rent • Lease

**EURODATA INC.**

2574 Sheffield Road  
Ottawa, Canada K1B 3V7

613-745-0921

FAX: 613-745-1172

**VAX RENTALS**

MV 3600

MV 3800/3900

VAX 6000 SERIES

VAX 8000 SERIES

Systems & Peripherals

- Fast Turnaround
- Dependable Products
- Upgrade/Add-On Flexibility

• 6 Months • 12 Months • 24 Months

**BROOKVALE ASSOCIATES**

EAST COAST WEST COAST

(516) 273-7777 (206) 392-9878

We buy, sell, lease & rent  
quality new and used equipment.  
And we stand behind it for a year.

**Inventory Clearance Sale**

KA630-AA  
w/1-16 Lc.  
\$10,000.00

**Licenses**

MV11 1-16 User

License \$8500.00

MV11 1-8 User

License \$5000.00

MV11 VMS 5.0 Meg

Doc Kit \$1150.00

MV11 Decnet E/N

License \$1050.00

LAVC License

\$1250.00

**LA 210-AA**

\$685.00

LA 120-AA/SA

\$475.00

Prizrenix P300

\$700.00

LQPS-AA

\$125.00

**DHVI-AP**

\$670.00

DHVI-AM

\$475.00

DERP-RC

\$1450.00

KDA50-SA (New)

\$3500.00

**VT220**

Completely Recond.

Amber Terminals

Qty. available. 90

day warranty....

\$285.00

**TRIDEX**  
CORPORATION

Phone: 603-886-0383  
Fax: 603-886-0914

375A WEST HOLLIS ST. NASHUA, NH 03061

**sun**  
microsystems

**IBM digital**

**WE RENT VAX**

MV11 • MV 3000  
DISK • TAPE • CRT  
DEC Station 3100

3- to 6-month term  
Immediate delivery  
Purchase accruals

"Since 1966"

Equipment Corporation

26319 145 North

The Woodlands, TX 77380

TEL: 713-212-1171

1-800-288-1846

We buy surplus DEC/VAX

**Reconditioned**

**digital**

Equipment

Whatever your requirements are for  
Digital Equipment, call CSI first! Buying,  
selling, trading, leasing, consignments -  
we do it all!

CSI sells all equipment with a 30  
day unconditional guarantee on parts  
and labor and is eligible for DEC  
maintenance.

Offering systems, disk drives, tape  
drives, printers, terminals, memory, op-  
tions, boards, upgrades and many  
more.

**CSI**

Compuex Systems, Inc.

75 Tosca Dr. Stoughton, MA 02072

CALL TOLL-FREE 1-800-426-6499

In Mass. (617) 344-8600

FAX (617) 344-4199

**BUY, SELL**

**LEASE**

**IBM CPU's**

3081's, 3083's,  
3084-QXX, 3090

PILLAR SILENT BLOCK,  
PARALLEL CABINET

**GTEX**  
FINANCIAL  
GROUP, Inc.

EQUIPMENT LESSOR AND DEALER

(214) 783-1212

**Est. 1978**

SALE OR  
LEASE

**DATA GENERAL**

• MV20000

• 5.5MIPS

• ZERO TO 64 MB

• MV15000 UPGRADES

• MOD 10 TO 20

• MOD 8 TO 20

• MOD 8 TO 10

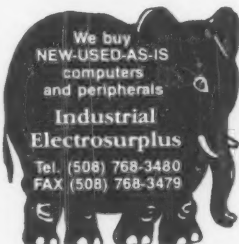
213-215-4641

**CATALINA**  
COMPUTERS, INC.

1001 W. Arbor Vitae St.

Inglewood, CA 90301

FAX 213 649-1065



We buy  
NEW-USED-AS-IS  
computers and  
peripherals

**Industrial**

**Electrosurplus**

Tel. (508) 768-3480

FAX (508) 768-3479

Go Shopping in...  
Computerworld's

**CLASSIFIED**  
**MARKETPLACE**

Call for all the details

(800) 343-6474

(In MA, (508) 879-0700)

Computerworld's  
**Classified Marketplace**  
needs only 6 days notice  
to run your ad!

When you're selling, you want your advertising to hit the market quickly and frequently.  
You can't afford to wait for an issue that's coming out several weeks -- or months -- into  
the future. With Computerworld, there's no waiting for the next available issue because  
we've got one waiting for you every week. What's more, your ad can appear in the Mon-  
day issue of Computerworld if you order it as late as 6 days prior to the issue (Tuesday).  
So if you're selling computer products or services, advertise in the newspaper that  
won't keep you waiting. Advertise in Computerworld's Classified Marketplace!

For more information, call

800/343-6474

(In MA, 508/879-0700)

**HONEYWELL**

LEVEL 6 DPS 6 SERIES 16

• Complete Minicomputer Line  
New & Used

• All Peripherals and Terminals.

• Upgrades and Features

• Depot Repair Capability

• Honeywell Maintenance

Guaranteed

• Immediate Delivery

Low Prices

• HDS 5 and HDS 7

Compatible Terminals

The Recognized Leader

In Honeywell Minicomputer

Sales and Support

**BSC**

BOUDREAU COMPUTER SERVICES

100 Bearfoot Road

Northboro, MA 01532

(508) 383-6839

FAX 508-393-5741

# CLASSIFIED

## Buy/Sell/Swap

### CALL US LAST

GET YOUR BEST PRICE  
Then Call  
**SPECTRA PRODUCTS, INC.**

For The Best DEAL  
WE

Buy - Sell - Lease - Rent

IBM and DEC™ SYSTEMS

NEW and USED

Other Services Available  
Installation and Maintenance  
Contract Programming

Call 800-238-6405  
IN TN 901-754-8500



**SPECTRA PRODUCTS, INC.**  
1669 KIRBY PKWY. MEMPHIS, TN 38119

"SINCE 1974"

Formerly Computer Brokers, Inc.

#### Northeast Terminal & Computer Services

Box 330, Billerica MA 01821 • 800-448-0009 • (617) 727-9670 • FAX (508) 667-1626

#### Southeast Terminal Corporation

Box #529, Mobile Sound FL 33475 • 800-633-5887 • (407) 546-1112 • FAX (407) 546-1137

"NEW" REFURB	REFURB	REPAIR
VT220 ..... Call ..... 325	LA50 ..... 325	Zenith PC ..... Call
VT320 ..... 450 ..... 350	LA75 ..... 675	IBM PC ..... Call
VT330 ..... 1655 ..... 1295	VT100 ..... 150	DEC, Cilog, Wyse, Qume,
VT340 ..... 2450 ..... Call	VT101 ..... 175	Leas/Siegler, TVI CRT's
LA120 ..... Call ..... 595+	VT102 ..... 195	Most Printers ..... 125
LA100 ..... 995 ..... 595+	VT103 ..... 375	Most Keyboards ..... 65
LA210 ..... 1395 ..... 995	VT131 ..... 195	LA120 (PS) ..... 95
WY60 ..... 350 ..... 175	CT101 ..... 125	LA120 (LB) ..... 95
WY60, 75, 85 ..... 420 ..... 250	CT101E ..... 175	LA210 (PS) ..... 75
WY60, 75, 85 ..... 420 ..... 325	CT1220+ w/o kbd ..... 150	LA210 (LB) ..... 95
Vicentech	TV921 ..... 195	Hard disks ..... Call
VT320 comp. 420	Visual 241 ..... 295	
VT330 comp. 1195		

Depot Repairs • Upgrades • Modules • Leases • On-Site Maintenance • 24-Hour Turnaround

**BUY DEC • DG**

VAX, MICROVAX • MV SERIES

- Systems
- Peripherals
- Modules

~ICE Bugs for Inventory~  
~NO ICE Bugs~

Call: George H. Trautwein  
Int'l Computer Exchange, Ltd.  
(617) 585-9688  
FAX: (617) 585-9177

**NEW USED**

#### IBM AS/400 Mod 60

For Sale

64 MB, 3-9309, 4-6110, 9331,  
3-9335A1, 6-9335B1, 9347,  
2-6236, 6232, 6040, 6240,  
4-3196, 5030;

Large, powerful system,  
IBM maintained.  
May take smaller AS/400  
in trade.

N. Rasmussen  
(617) 367-3210

## WANTED

**OBSOLETE  
AND EXCESS  
COMPUTER  
EQUIPMENT**

**Top Cash Paid**

We purchase all types of obsolete  
or excess computer equipment  
and peripherals. We pay costs for  
all shipments as well as top prices.

Call today for a quote  
on your system.

**COMPU-SCRAP, Inc.**  
Randolph, MA 02368  
(617) 341-2695  
Call Collect

*Distinctive  
Data Processing*

**For Sale or Rent**

IBM Communication Controllers

**3720's**

**Short Term Rentals  
Available**

Call

(214) 869-2214

FAX: 214-869-1589

11419 Marlin, Ste 210, Dallas, TX 75224

MV II  
KA6300Y-A3

**VAXES**

11/780  
11/750  
11/730

LA 100-BA  
LQ P02  
LA120

**1 DAY SHIPMENT  
SALE or LEASE!**

**617-267-8600  
FOR SALE BY OWNER**

## Software

### FREE BUYER'S GUIDE

When you need programmer's develop-  
ment tools, Programmer's Connection is  
your best one-stop source. We are an  
independent dealer representing more  
than 300 manufacturers with over 800  
software products for IBM personal  
computers and compatibles including:  
COBOL, compilers and utilities, relational  
databases, and much more. Call today  
to receive a **FREE** comprehensive  
Buyer's Guide, and find out why  
Programmer's Connection is your best  
connection for software tools.

**Programmer's Connection**

7249 Whipple Ave NW  
North Canton, Ohio 44720

**US 800-336-1166**

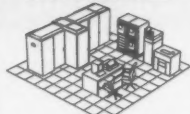
Canada 800-225-1166

International 216-494-3781

FAX 216-494-5260

Telex 9102406879

### ROOMER2



Create computer room layouts and 3D views with  
your IBM PC or compatible. New library of com-  
puter components makes it quick and easy. From  
\$295. Call for free brochure. Money Back  
Guarantee.

Hulsteg Software • PO Box 747  
Clanton, PA 16114 • (814) 326-5600

**ATTENTION: TO ALL PC OWNERS!**  
New, protect your DOS as well as  
programs & confidential files from  
intruders with Pro-Tek Password, the  
ultimate in password protection due  
to its design. Protection of the  
DOS operating system will further  
provide peace of mind knowing that  
nobody can search directories, copy  
files, or delete programs & files.  
Protect your investment & maintain  
further security than ever before.  
Requirements: DOS (PC com-  
patibles): 2 5 1/4 disks or 1 disk & hard  
disk. Money back guarantee. Now,  
get the satisfaction of PC security  
today! Send \$29.95 + \$3.00 S&H or  
MC or Visa giving card # & expira-  
tion date to: Pro-Tek Password Soft-  
ware, Box 1894, Falls, Texas 75757  
(804) 253-2640.

### SOFTWARE PRODUCTS WANTED

If you have software you think has  
commercial potential, send us a  
brief description with an address  
and phone number, and we'll send  
you a free market evaluation.  
We're interested in all types of  
software - mainframes, mini or PC;  
systems, utilities, and applica-  
tions.

**Pacific World Trading Co.**  
PO Box 3573  
Walnut Creek, CA 94598

## Hardware

**BUY SELL  
LEASE  
DEC/VAX**

CALL  
LDI/  
COMPUTER  
PROVISIONS

Lou Vascek

(216) 687-0307

### It's the CLASSIFIED MARKETPLACE

**Reach Computer  
Professionals  
Where They Shop**

- ☐ Buy/Sell/Swap
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunity

**CALL NOW**

**800-343-6474**  
(In MA, 508/879-0700)

## Peripherals/Supplies

**AVAILABLE  
NOW**

**IBM  
Qty.  
4224-201s  
PRINTERS**

Call: Don Cullars  
704-365-4777  
FAX: 704-365-0777

AMERICAN DATA CO. INC.  
PO Box 22151 • Charlotte, NC 28222

**HP HEWLETT  
PACKARD  
GENUINE  
TONERS**

**\$8150**

QUANTITIES OF  
3 OR MORE  
Series 8 (82285A) or Original (82285A)  
same inventory in stock!  
For Same Day Shipment Call:  
+1-800-22-TONER  
+1-800-228-6637  
FLOTTOR SUPPLIES AT SIMILAR SAVINGS  
**TONERS PLUS...**

Go Shopping in...  
Computerworld's  
**CLASSIFIED MARKETPLACE**  
Call for all the details  
**(800) 343-6474**  
(In MA, 508/879-0700)

### Computerworld's Classified Marketplace

**delivers your message to  
companies that plan to buy  
your product or service.**

From PCs to minis, mainframes to  
supercomputers, Computer-  
world's readers buy products  
across all ranges of today's com-  
puters. So if you're selling, adver-  
tise in the newspaper that delivers  
readers that plan to buy YOUR  
product or service. Advertise in  
Computerworld's Classified Mar-  
ketplace!

For more  
information, call  
**800/343-6474**  
(In MA, 508/879-0700).

**COMPUTER DATA DISPLAYS**  
PC Screen to Large Screen  
Look to BOXLIGHT—The LCD  
Specialist—For the Right System  
to Meet Your Needs.

**KODAK  
DATASHOW**

+Eiki, Apollo, Chisholm and others.  
Prices start at:

**\$599**

Solutions for VGA, EGA, CGA,  
all MAC's & more.  
MIC, VISA, AMEX & COD

**BOXLIGHT  
CORPORATION**

(415) 892-4744

Computer-Based Presentation Systems  
Since 1984

### Computerworld's Classified Marketplace works.

Just ask Chuck Youngblood, President  
of Mountain Marketing, a Houston,  
Texas, company specializing in buying,  
selling, and installing the special raised  
flooring, power sources and climate  
control equipment for data centers. "In  
six weeks Computerworld's Classified  
Marketplace pulled customers I other-  
wise couldn't have gotten to in six  
years. No other publication has deliv-  
ered the kind of valuable customers  
Computerworld's Classified Mar-  
ketplace has."

Or ask any one of the hundreds of com-  
panies who successfully sell their prod-  
ucts to readers of Computerworld's  
Classified Marketplace. They'll tell you  
why they advertise in Computerworld.  
Because it works.

For more information, Call:  
**800/343-6474**  
(In MA, 508/879-0700)

## Graphics/Desktop Publishing



**Time/Services**

**DEC - 20**

**We run your programs while you work on the future.**

**LANDART SYSTEMS, INC.**  
65 Broadway, NY, NY 10006

**212-363-3170**

**COMPUTERWORLD'S  
CLASSIFIED  
MARKETPLACE**

Examine the issues while Computer Professionals examine your message.

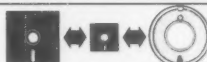
**Call for all the details.**

**(800) 343-6474**  
In MA., (508) 879-0700

**NEW AND USED  
RAISED  
FLOORING**

**Immediate Delivery  
Quality Installation**

**Raised Computer Floors**  
One Charles Street  
Westwood, NJ 07675  
**(201) 666-8200**  
**FAX (201) 666-3743**



**INCOMPATIBLE COMPUTERS?**  
Disk Interchange Service Company specializes in transferring files between incompatible computers. Our seven conversion systems support 100+ formats.

- STRACK TAPE TO DISKETTES
- DEDICATED WORD PROCESSORS
- 3.5", 5.25" & 8" FORMATS

Additional Services Include:

- Database & Spreadsheet Conversions
- Custom Program/Data Reformatting
- Data Entry

Disk Interchange Service Co. (DISC)  
2 Park Drive • Westford, MA 01886  
(508) 692-0050

**Full-Service  
Cost-Effective  
Compute Utility**

■ Three IBM 3090E CPUs

■ Operating Environments  
• MVS-ESA, XA, SP  
• VM-XA, SP, DOS  
• PRISM  
• Standalone

■ DB2 and IMS Databases

■ Technical Support Desk  
• 24 hours-7 days/week

■ Nationwide Network

**FLEXIBLE SOLUTIONS...**  
from special projects to  
data center replacements

■ Application and  
Engineering Processing  
• Financial, NASTRAN,  
ANSYS, SAS ...

■ MSA-M&D Support

■ Conversion Services

■ Client Disaster Recovery

**INET** Information  
Network  
Corporation

For More Information,  
and Pricing,  
Call 1-800-222-1590

**Software  
Packaging**

- Disk duplication
- All formats
- EVERLOCK copy protection
- Label/sleeve printing
- Full packaging services
- Warehousing
- Drop shipping
- Fulfillment
- 48-hour delivery
- Consultation & guidance

**800-243-1515**

**Star-Byte, Inc.**  
2320 Bargey Rd. Hatfield, PA 19440



**NOOTECH**  
Innovative Computer Techniques

**COMPUTER SERVICES**  
**IBM 3084**

• Batch Processing • Public Network Access  
• Timesharing • Laser Printing

Route 202, Marlton, N.J. 08059  
**201-685-3400**

Contact Joyce Bogaenko

**The  
CLASSIFIED  
MARKETPLACE**

Reach Over 612,000  
Computer Professionals  
When They Reach For  
**COMPUTERWORLD!**  
**(800) 343-6474**  
(In MA. (508) 879-0700)

**Let Us Be  
Your Data Center**

Get high-quality computing service that can make a difference to your bottom line. From MCN Computer Services.

Full IBM compatibility including:

**MVS-ESA**  
VM/XA DB2  
CICS IMS  
TSO/E IDMS/R  
ROSCOE QMF  
PROFS

Programmer Productivity Aids:

- FILE-AID
- CICS PLAYBACK
- dBUG-AID
- ABEND-AID
- CICS ABEND-AID

We provide state-of-the-art systems, software and security for major clients across the country. And we deliver high-quality, cost-effective services that include:

- Computer Electronic Printing
- Letter Shop

For more information, call Karen Gray at:

**1-800-521-0444**

**MCN**  
Computer Services, Inc.

5225 Auto Club Drive  
Dearborn, MI 48126

**ON-LINE WITH  
COMPUSOURCE**

- ▲ Multiple centers
- ▲ MVS, VM, DOS
- ▲ RACF, CICS, IMS
- ▲ SAS, DB2

- ▲ Volume and term discounts
- ▲ Worldwide access
- ▲ Full technical support
- ▲ Laser printing
- ▲ Disaster recovery services

**COMPUSOURCE**  
(919) 469-3325

**SOFTWARE  
CONVERSIONS**

Mainframe conversions custom tailored to your specs. Our rates are very competitive. We do the work offsite saving you valuable office space, people, and machine time.

- DOS to MVS
- System/36 to AS/400
- RPG to COBOL
- Machine Conversions
- Data Base Conversions

**DBMS Software Services**  
6001 Gulf Fwy, Bldg. B-129  
Houston, TX 77023

**(713) 921-4022**

**COST-EFFECTIVE  
COMPUTING  
SERVICES for  
TODAY and ...  
TOMORROW**

**COMDISCO  
COMPUTING  
SERVICES CORP.**  
provides you with  
low-cost, state-of-  
the-art computing  
services.

- IBM® CPUs and Peripherals
- Systems Software: MVS/XA, TSO/E, ISPF/POF, CICS, VM/XA, VM/SP, HPO, CMS
- Application Software: Database Management, Application Development, 4/GLs, Statistical Analysis, Graphics
- Multiple Communications Methods
- Technical Support
- Pricing to fit your needs

IBM is a registered trademark of International Business Machines Corporation.

For more information  
Call Jeff Daum  
**201-896-2030**



**COMDISCO COMPUTING  
SERVICES CORP.**  
P.O. Box 26  
Carlstadt, NJ 07072

**MIS  
SUCCESS WITHOUT  
STRESS**

**NATIONWIDE REMOTE  
COMPUTING SERVICES**

- Fixed Price Computing
- Remote Facilities Management
- General Time-sharing Services
- Image/Forms Design and Laser Printing
- Integrated Financial Applications
- Major Third Party Software Packages
- Micro/Mainframe Applications
- Nationwide Network
- Operating System Conversions
- Overflow Processing

**DATA CENTERS:**  
Boston, MA  
Los Angeles, CA  
Washington, DC

**CALL 1 800 PLAN LCS**  
**1 800 752-6527**

**Litton**  
Computer Services

**Bids/Proposals/Real Estate**

**METROPOLITAN TRANSPORTATION AUTHORITY NOTICE** is hereby given that the Metropolitan Transportation Authority will receive proposals for the leasing of off-the-shelf software as indicated below. Proposals submitted shall include Vendor qualifications and Technical and Price proposals. An oral presentation and product demonstration may also be required. The software product will be selected using the following selection criteria:

1. The degree the product meets the requirements of the technical specifications.
2. The product that needs the least amount of computer and MTA Human Resources for support will receive the maximum point total.
3. The degree which this proposal meets MTA's training, support and maintenance requirement.
4. The vendors overall responsiveness to the RFP package. This criteria will include but not limited to providing the information requested, providing the information in the format requested, acceptance of MTA Terms and Conditions and pricing submitted as requested.
5. Total cost of the system.

Proposals must comply with the Authority's Contract Documents. The Authority, at its option, may enter into negotiations with one or more proposers as it deems fit for the information for Proposers section of the Contract Documents. Copies of such documents may be secured from Ms. Angie Phifer, Secretary, Metropolitan Transportation Authority, 347 Madison Avenue, New York, NY 10017.  
RFP: 8-01-89327-0 DATE: 7/20/89 TIME: 3PM  
FOR: "Report Distribution Software System."

**MISSISSIPPI CENTRAL  
DATA PROCESSING AUTHORITY**

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

**Request for Proposal No. 18111**, due Wednesday, July 19, 1989 at 3:30 p.m. for the acquisition of the online CICS-based version of R. L. Polk and Company Vehicle Inventory Number Edit software and the Minnesota Automobile Pricing module or their compatible equivalent for the MISSISSIPPI STATE TAX COMMISSION.

**Request for Proposal No. 18114**, due Monday, July 17, 1989 at 3:30 p.m. for the acquisition of insurance coverage for state-owned and leased computer systems for the STATE OF MISSISSIPPI.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to revise information.

Patsy Stanley @ (601) 359-2804

**Computerworld's  
Classified Marketplace**  
gives you reach to over  
612,000 potential buyers!

And this audience is even verified by the Audit Bureau of Circulations in the only independently audited pass-along survey of its kind. What's more Computerworld's Classified Marketplace penetrates buying companies in all major industries. That's because Computerworld's total audience blankets key vertical markets that are major buyers - and major buyers - of computer products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers over 612,000 potential buyers. Advertise in Computerworld's Classified Marketplace!

For more information, call

**800/343-6474**  
(In MA. (508) 879-0700)

**STATE OF CONNECTICUT  
D.A.S. BUREAU OF PURCHASES  
REQUEST FOR  
PROPOSAL (R910)**

The State of Connecticut is seeking bids for a turnkey information system for the Department of Mental Health to support the Department's 9 major facilities, 5 regional offices, and the Office of the Commissioner. The system will also address portions of the information system needs of 150-plus community mental health programs throughout the State that are funded by the Department of Mental Health. Application software sought includes: Master Patient Index, Patient Registration, Services Reporting, Medical Records, Quality Assurance, Pharmacy, and General Ledger. Vendors will be asked to provide software, software implementation, training, and ongoing support for a minimum period of 3 years, after acceptance by the State. Pharmacy is the only application software package that may be proposed by vendors as a separate entity.

As part of vendor proposals, vendors must specify the hardware configurations on which their systems will run. If you can fulfill these requirements, and provide the necessary experience, expertise, and software, you are encouraged to request a copy of the RFP specifying the above reference number from:

**State of Connecticut**  
Office of Resources & Facilities Planning  
340 Capitol Avenue, 1st Floor  
Hartford, CT 06106  
(203) 566-3304

A pre-bidders conference will be held on July 25, 1989 at 10:00 AM ET at the Department of Mental Health Training Center, Connecticut Valley Hospital, Haviland Hall, Middletown, Connecticut.

**JOHN W. OTTERBEIN  
DEPUTY COMMISSIONER**

**INFORMATION SYSTEM  
REQUIREMENTS**

The Denver Public Schools will, during August 1989, release a Request for Proposal that addresses Financial Systems and Human Resources Systems Vendors with a track record of providing successful information systems to large public school districts (50,000 plus students) are encouraged to request a copy of the requirements overview packet from:

Thomas J. Hansen  
3800 York Street  
Denver Public Schools  
Denver, CO 80205

Minority or Women owned or operated firms are encouraged to participate.

**Classified  
MARKETPLACE**  
Where Computer  
Professionals Shop  
**(800) 343-6474**  
**(508) 879-0700**

# TRAINING

## All work and full pay bears fruit

Executive MBA programs combine studies with full-time employment

BY MEGAN SANTOSUS  
SPECIAL TO CW

Like many information systems professionals with a technical background, IBM programmer Pam White wanted to learn more about business and decided to pursue a master's degree. White did not want to face the financial hardship of quitting her job to attend school full-time, so she enrolled in an "executive MBA" (EMBA) program that let her remain on the job while earning the degree in two years.

Alberto Gude Jr., vice-president of IS at Enron Corp. in Houston, also opted for the EMBA route, enrolling at the University of Houston and finishing the program in 1987. He already had a bachelor of science in accounting but wanted to be on par with peers who held a master's degree in business or a doctorate.

EMBA's are designed for mid-career professionals who want to broaden their knowledge of business without interrupting their careers. Classes typically meet all day Friday and Saturday on al-

ternate weekends year-round for two years.

Admission standards differ, but most programs require 10 years of working experience and some managerial responsibility. Currently, about 5,000 students are enrolled in more than 100 EMBA programs nationwide, according to Ernie Scalberg, assistant dean for Executive and Fully Employed MBA Programs at the University of California at Los Angeles.

The cost of an EMBA can vary from \$10,000 to \$60,000, depending on the university. The tuition tends to be greater than that of a conventional MBA program because it includes all possible costs—books, lodging, meals and even parking permits. Employers take care of the bill for a majority of students—about 70% of them, according to Scalberg.

Compared with conventional MBA programs, EMBA classes tend to stress practical, on-the-job applications, according to program directors. Students typically work on business plans that they can apply to their

work; the concept for Adolph Coors Co.'s Coors Light beer was originally developed in an EMBA program, says Ron Gist, director of the EMBA program at the University of Denver.

In addition to the greater understanding of business that she sought, White says she acquired

the Worldwide Information Systems Recruiting Practice at Russell Reynolds Associates, Inc. in New York. "I've seen jobs come down to two people with the same skills that were decided in the end by educational credentials."

"Today, the biggest demand for executive talent is among people who are business-oriented," Sanders adds. "An IS person with an MBA degree demonstrates that extra push that employers are looking for, espe-

While the rewards of getting an EMBA degree can be numerous, so can the drawbacks. Students spend up to 30 hours a week on course work, says Scalberg. "Programs are tough because they take all available time and energy," he says. "Typical students are really motivated to succeed and advance."

Potential students should be aware of the tremendous amount of pressure that can accumulate at work and at home, according to graduates. Because of the demanding schedule, extra hours at work must be limited, and that can lead to tense relations with both supervisors and peers. Some students also encounter resentment from peers who identify them as fast-trackers.

"Be prepared to have no social life for two years," Gude says. Students at least find moral support among one another in facing such hardships, he adds.

The hectic schedules and personal sacrifices notwithstanding, the EMBA experience draws positive reviews from Gude and White. Both graduates say the relationships they formed with other students were just as educational as the classes.

Santosus is an editorial assistant at CIO magazine.

**B**E PREPARED to have no social life for two years."

ALBERTO GUDE JR.  
ENRON

interpersonal skills through her program. "I want to eventually get into management," she says, "and the confidence and tools I gained help me communicate with managers."

An executive recruiter specializing in top-level IS positions says he thinks an MBA degree has become more a necessity than a competitive advantage.

"An MBA is no longer gold, but mandatory," says Norm Sanders, managing director of

cially now that information technology can provide a company's real competitive edge."

Currently, the demand for business-oriented IS people far exceeds the supply, and there are no signs of the shortage letting up in the near future, according to Sanders. As a result, starting salaries for IS people with MBA degrees tend to be 25% higher than those of their counterparts without MBAs, he says.

### We Cover All the Bases.

For over 16 years, On-Line Software has provided the finest software training to IBM® users. We offer the most current courses, taught at the latest releases.

Classes offered:

- CICS      ■ VSAM
- DB2      ■ CICS/DL/1
- SQL      ■ VTAM

We also offer training in the use of our products—RAMIS®, UFO®, InterTest®, and VERIFY®. All courses are held at locations throughout the U.S. and Canada, and are also available on-site.

For immediate registration, or for more information, call the Education Department toll-free at 800-642-0177. In Canada, call 201-592-0009.

Register by June 15, 1989 and—upon completion of a course—receive a **FREE** copy of **Command Level Programming** by William Bruno and Lois Bosland, a \$19.95 value.

Redeem this coupon for your free book. Only original coupon will be accepted.

IBM is a registered trademark of International Business Machines.



**On-Line Software**  
INTERNATIONAL

The Safe Buy.

### TELETUTOR X.25 Course

The best computer-based training in the business.

TELETUTOR®

TELECOMMUNICATIONS  
TRAINING SERIES

For FREE  
catalogue of all  
our courses call

**800-542-2242**  
(603) 433-2242

Dear MIS Director,  
are you tired of hand-  
holding the employees of  
your company during  
their PC computer  
training sessions. Allow  
ACT to relieve your bur-  
den so that you can get  
back to your job.

Standard and cus-  
tomized training.

Our training and  
facilities are used by  
major corporations and  
universities.

ACT is an authorized  
Novell site

**ACT**

American Computer Training  
600 Third Avenue @ 40th St.  
New York, NY 10016

Call Anne Muller  
at 212-808-9700

### Computerworld's Training Editorial Schedule

#### July 3

Entry-level training: moving  
beyond COBOL to reflect the  
trainee's real work

#### July 10

Courseware: to develop or buy?

#### July 17

Developing a training needs  
analysis

#### July 24

Tailored enduser training

#### July 31

Should information centers  
report to the technical training  
manager?

## SALES OFFICES

Publshar/Fritz Landmann

**Senior Vice-President/Associate Publisher/Vol. Landi, COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171. (508) 879-0700

**BOSTON:** Regional Vice-President - North/David Peterson, District Manager/Bill Cadigan, Sherry Driscoll, District Manager/John Werts, Sales Assistants/Alice Longley, Lisa Bonaccorso, Paula Wright, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

**CHICAGO:** Regional Vice-President - Midwest/Kevin McPherson, Senior District Manager/Larry Craven, Sales Assistants/Kathy Sullivan, Carl Lange, **COMPUTERWORLD**, 1400 West Higgins Road, Suite 300, Rosemont, IL 60018. (312) 827-4433

**NEW YORK:** Regional Vice-President - East/Bernie Hockswender, District Manager/Fred LoSapio, Paula Smith, Sales Assistants/Linda Pappas, Patricia DeBlase, **COMPUTERWORLD**, 1400 West Higgins Road, Suite 300, Rosemont, IL 60018. (312) 827-4433

**LOS ANGELES:** Regional Vice-President - West/Jan Harper, Southeastern Regional Manager/Carolyn Knor, Sales Assistant/Bey Raus, **COMPUTERWORLD**, 1400 West Higgins Road, Suite 300, Rosemont, IL 60018. (312) 827-4433

**SAN FRANCISCO:** Regional Vice-President - West/Jan Harper, Senior District Manager/Ernie Chamberlain, District Manager/Michela O'Connor, Alicia Saraballa, Sales Assistants/Chris Kobayashi, Nurt Klemm, Cynthia Yarker, **COMPUTERWORLD**, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010. (415) 347-3455

**ATLANTA:** Regional Vice-President - East/Bernie Hockswender, Account Manager/Melissa Christie Neighbors, Sales Assistant/Debra Brown, **COMPUTERWORLD**, 1400 West Higgins Road, Suite 300, Rosemont, IL 60018. (312) 827-4433

**DALLAS:** Regional Vice-President - Midwest/Kevin McPherson, Southeastern District Manager/Darren Ford, Sales Assistant/Brenda Shpman, **COMPUTERWORLD**, 1400 West Higgins Road, Suite 300, Rosemont, IL 60018. (312) 827-4433

**WASHINGTON, D.C.:** Regional Vice-President - East/Bernie Hockswender, District Manager/Paula Smith, **COMPUTERWORLD**, 1400 West Higgins Road, Suite 300, Rosemont, IL 60018. (312) 827-4433

## CW PUBLISHING/INC.

An IDG Communications Company

Fritz Landmann/President

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 508-879-0700, Telex: 95-1153, FAX: 508-879-0564

Senior Vice-President/Associate Publisher, Vol Landi

Operations Vice President/Operations, Matthew Smith, Business Manager, Mark Sullivan

Sales Advertising Director, Carolyn Novack, Classified Advertising Director, John Corrigan

Marketing Vice President/Business Development, Kevin Harrell, Manager, Marketing Communications, May Doyle

Account Manager, Marketing Communications, Elizabeth Phillips, Manager, Trade Show & Conventions, Audrey Shohan

Circulation Director of Circulation Management, Maureen Burke, Director of Circulation Promotion, Carol Spach

Production Vice President/Manufacturing, Leigh Hometh, Assistant Production Director, Carol Polack

Production Manager, Beverly Wolff, Art Director, Tom Monahan

Publisher's Office Assistant to the President, Karen Elliott, Assistant to the Senior Vice-President, Libby Levinson

## FOREIGN EDITORIAL/SALES OFFICES

**Argentina:** Ruben Argente, CW Comunicaciones S/A, Av. Belgrano 406-Rio 9, CP 1092 Buenos Aires, Phone: (011) 54 134-5583, Telex: (260) 22644 (BACAR AR)

**Ale:** S.W. Chen, Asia Computerworld Communications Ltd., 701-4 Kim Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong, Phone: (011) 852 5 861 3238, Telex: (780) 72627 (COMWOR HK), Fax: (011) 852 5 86 1263

**Australia:** Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Uxbridge, NSW 2065, Phone: (011) 61 2 4305133, Telex: (790) AA74752 (COMWOR AU), Fax: (011) 61 2 439 5512

**Austria:** Manfred Weiss, CW Publikationen Verlags Ges.m.b.H., Zieglergasse 6, A-1070 Wien, Austria, Phone: (011) 43-6516-31-0 or (011) 43-93-05-08-0, Telex: 115542 SCH/A, Fax: (011) 43-93-05-08-33

**Brazil:** Ney Kruel, Computerworld do Brasil Ltda, Praça Floriano, 19/26 Andar, CEP-20031 Rio de Janeiro, Phone: (011) 55 21 240 8225, Telex: (391) 21 30380 BR

**Denmark:** Preben Engell, Computerworld Danmark A/S, Torngade 52, 1400 Copenhagen K, Denmark, Phone: (011) 45 1955 695, Telex: (855) 31565, Fax: (011) 45 154 56 14

**France:** Francois Chaussonnier, Computerworld Communications S.A., 185 Avenue Charles de Gaulle, 92200 Neuilly Sur Seine, France, Phone: (011) 33 1 47 1272, Telex: (842) 613234 F, Fax: (011) 33 1 42 1562

**Hungary:** Dezső Futacs, Computerworld Informatics Co., Krt. Pf. 366, 1536 Budapest, Hungary, Phone: (011) 36 1 228 456, Telex: (861) 22 6307 (HSH H)

**Italy:** Umberto Contarini, Computer Publishing Group S.R.L., Via Vida 7, 20127 Milano, Italy, Phone: (011) 39-2 2613432, Telex: (843) 335318, Fax: (011) 39 2 282 0865

**Japan:** Dick Yashita, Computerworld Japan, Akasaka Omotenashi Bldg., Minato-Ku, Tokyo 107, Phone: (011) 81 3 551 3862, Telex: (781) 252-4217, Fax: (011) 81 3 552 7239

**M. Nakamura,** IDG Communications, Japan, c/o Marcom International, Inc., Akasaka Center Building, 1-3-12 Motoakasaka, Minato-Ku, Tokyo 107, Japan, Phone: (011) 81 3 403-8515, Telex: (781) 27941 (jeps) for all CW Publishing publications except Computerworld Japan

**Mexico:** Henry Morales, Computerworld Mexico S.A. de C.V., Osasco 21-2, Mexico City 7 D.F., Colonia Roma, 06700 Mexico, Phone: (005) 514 4218 or 6309, Telex: (383) 177 1300 (ACHAME)

**The Netherlands:** Wout Berends, IDG Communications B.V., Poulus Rotterdam 18, 1071 DA Amsterdam, The Netherlands, Phone: (0031) 20 664 64 26, Telex: (844) 18242 (CWCOM NL), Fax: (0031) 20 79 60 06

## IDG COMMUNICATIONS/INC.

Patrick J. McGovern

Board Chairman

Andi Lubala

Vice Chairman

William P. Murphy

Vice President/Finance

Computerworld is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 90 computer publications in 33 countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the IDG News Service offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA'S Computerworld Argentina; ASIA'S Communications World; Computerworld Hong Kong; Computerworld Southeast Asia; PC Review; AUSTRALIA'S Computerworld Australia; Communications World; Australian PC World; Australian Micro; Computerworld Österreich; BRAZIL'S DataNews; PC Mundo; Micro Mundo; CANADA'S Computer Data; CHILE'S Informatica; Computacion Personal; DENMARK'S Computerworld Denmark; PC World Denmark; CAD/CAM World; FINLAND'S Mikro, Teletuvisio; FRANCE'S Le Monde Informatique; Distribution; InfoPC; Telecoms International; GREECE'S Computer Age; HUNGARY'S Computerworld SZT; PC Mikro; INDIA'S Dataquest; PC World India; ISRAEL'S People & Computers Monthly; PEOPLE & Computers Weekly; SAM Monthly; ITALY'S Computerworld Italia; JAPAN'S Computerworld Japan; Sen-ton News; MEXICO'S Computerworld Mexico; PC Journal; THE NETHERLANDS' Computerworld Netherlands; PC World Benelux; NEW ZEALAND'S Computerworld New Zealand; Computerworld Norge; PC World Norge; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld Monthly; SAUDI ARABIA'S Arabian Computer News; SOUTH KOREA'S Computerworld Korea; PC World Korea; SPAIN'S C/mondo; Computerworld Espana; Commodore World; PC World Espana; Communications World; SWEDEN'S Computer Sweden; MikroNetum; Svenska PC World; SWITZERLAND'S Computerworld Schweiz; UNITED KINGDOM'S Computer News; C/ Today; Lotus; PC Business World; UNITED STATES' Amiga World; C2-ROM Review; CIO, Computer Currents, Computerworld, Digital News, Federal Computer Week, 80 Micro, Focus Publications, InfoStar, Informal, Macintosh Today, Macworld, Computer + Software News (Micro Markers/Labour-Friedman), Network World, PC Letter, PC World, Percible Computer Review, Publisher, PC Resources, Run, WINZUELA'S Computerworld Venezuela; WEST GERMANY'S Computerwoche, Information Management, PC Welt, PCWoche, Run/Run Specials.

# ADVERTISERS INDEX

Ashton-Tate.....	78-79	Mansfield Software.....	67
AT&T.....	80-81	McCormack & Dodge.....	C4
		McDonnell Douglas Case.....	10
		Mdbs.....	73
BMC Software.....	65	Memorex/Telex.....	48/49
Bull Peripherals.....	93	Micro Focus.....	37
Bull Worldwide Information Systems.....	62-63	MSA.....	74-75
Businessland.....	97	Multi-Tech Systems.....	44-45
		Must Software.....	24
Candle Corporation.....	C3	Novell.....	32,88-89
Codex.....	28-29	On-Line Software Int'l.....	116
Computer Associates.....	3,31,33,35,68-69	Oracle Corporation.....	9,13,15
Computer Task Group.....	87	ParcPlace.....	40
Computerland.....	60	Platinum Technology.....	23
Cullinet Software.....	84-85	Prime Computer.....	50-51
CW Circulation.....	117		
		Racal-Milgo.....	54-55
Data Design.....	66	Radio Shack.....	87
Datasouth.....	86	Realla.....	27
DCA.....	38-39		
Digital Equipment Corporation.....	30		
		Santa Cruz Operation.....	36
		SAS Institute.....	48
		Seed Software.....	72
		Siemens.....	98
		Software AG.....	12,22
		Software Engineering of America.....	11
		Sun Microsystems.....	56-59
		Syncsort.....	5
IBM.....	26,70,94-95	TBS Software.....	43
Informix.....	18-19	3M Corporation.....	99
Innovation Data Processing.....	7		
International Power Machines.....	64		
		US Sprint.....	16
Knowledgeware.....	34	Viking Software.....	67
		Vitalink.....	76
Leasametric.....	96		
Lotus Development Corporation.....	46-47	Wyse Technology.....	82

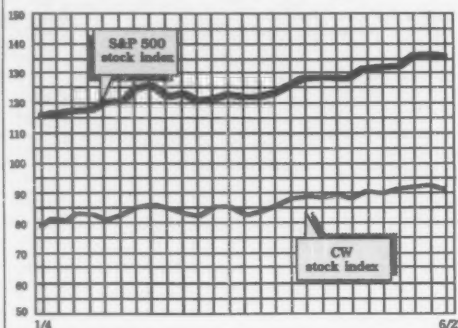
This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

## Look for These Upcoming Special Editorial Features in Computerworld

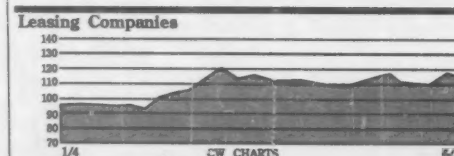
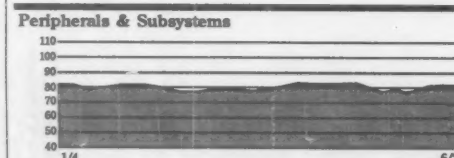
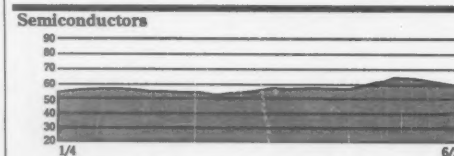
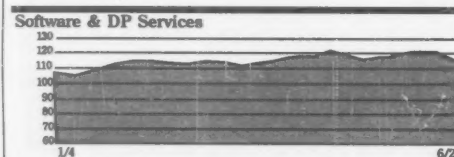
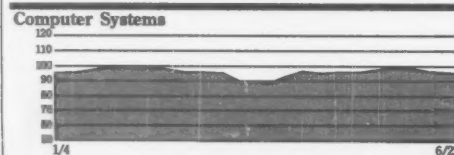
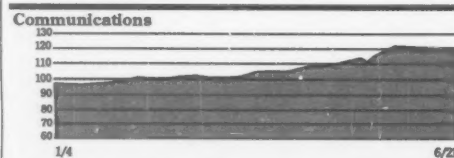
Issue Date	Executive Reports	Product Spotlights
July 3	Open	
July 10		Software for IBM Midrange
July 17	Networking — The Human Side of LAN Use	
July 24	Restructuring MIS: New Organizational Models	
July 31	Systems & Software: Preparing for Cooperative Processing	
Aug. 7		The MAC Market
Aug. 14	Management: IS Support for Flattened Organizations	



# STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	120.9	120.1
Computer Systems	97.4	95.3
Software & DP Services	120.2	115.7
Semiconductors	61.6	59.0
Peripherals & Subsystems	81.8	81.1
Leasing Companies	117.5	113.7
Composite Index	93.0	90.7
S&P 500 Index	136.5	135.4



## Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 21, 1989

SYMBOL	52-WEEK RANGE	CLOSE	WEEK NET CHG	WEEK PCT CHG
Communications and Network Services				
AMERICAN INFO TECHS CORP	62 44	57.75	-1.8	-2.7
ANDREW CORP	22 16	21.75	0.0	0.0
ARTEL COMM CORP	7 2	5.625	-0.3	-4.3
AT&T	37 24	36.25	0.4	1.0
AWANEX INC	7 4	5	0.1	2.6
AT&T	18 13	17.625	1.0	6.0
BELL ATLANTIC CORP	82 68	86.75	-0.5	-0.6
BELLSOUTH CORP	52 39	47.875	-1.1	-2.3
COMPRESSION LABS INC	9 3	7.75	0.0	0.0
COMPUTER NETWORK TECH	2 1	2.344	0.4	20.9
CONTEL CORP	63 33	62.25	2.6	4.4
DATA SWITCH CORP	6 4	4.125	0.1	3.1
DIGITAL COMM ASSOC	38 17	20.75	-1.8	-7.8
DYNATECH CORP	23 17	17.25	0.0	0.0
EPHONICS INTERNATIONAL	7 3	6.375	-0.3	-3.8
GANDALF TECHNOLOGIES	7 4	5.25	0.1	2.4
GENERAL DATA COMM INDS	6 3	5.125	-0.1	-2.4
GTE CORP	98 38	94.375	1.0	1.9
INFOTRON SYS CORP	13 10	11.375	-0.4	-3.2
ITT CORP	61 46	58.75	-0.1	-0.2
MA COM INC	11 8	8.125	-0.3	-3.0
MC COMMUNICATIONS CORP	42 14	39.75	0.8	1.6
NETWORK EQUIPMENT TECH	25 14	21.75	-1.8	-7.4
Q	12 8	8.375	0.0	0.0
NORTHWEST TELECOM LTD	20 14	18.625	-0.5	-2.8
Q	38 24	30	0.8	2.7
NYNEX CORP	84 63	79.5	-1.0	-1.2
PACIFIC TELECOM GROUP	43 28	38.625	-0.9	-2.2
PERTEL CORP	6 3	5.875	-0.1	-2.1
PLESSEY PLC	46 25	40	0.3	0.6
SCIENTIFIC ATLANTA INC	19 10	18	-0.3	-1.4
SOUTHWESTERN BELL CORP	54 38	49.875	-2.3	-4.3
3 COM CORP	29 16	17.5	-2.8	-13.6
U S WEST INC	72 53	70	0.4	0.5
Computer Systems				
ALLIANT COMPUTER SYS	7 3	4.875	0.0	0.0
ALPHA MICROSYSTEMS	8 6	6.5	-0.3	-3.7
ALTOX COMPUTER SYS	10 6	6.625	0.1	1.9
AMDAH CORP	27 16	21	-0.6	-2.8
APPLE COMPUTER INC	90 54	42.5	-7.1	-14.4
BOLT BERANEK & NEWMAN	19 7	8.125	-0.3	-3.0
COMING COMPUTER CORP	102 50	93.625	-3.0	-3.1
COMMODORE INTERNATIONAL	20 9	17.625	1.1	6.8
COMPUTER AUTOMATION INC	8 3	4	0.0	0.0
CONTROL DATA CORP	28 16	22.125	0.5	2.3
CONVEX COMPUTER CORP	15 7	12.75	-1.0	-7.3
CRAY RESH INC	89 46	51.5	-0.5	-1.0
DADSY SYS CORP	11 3	3.5	0.0	0.0
DATA GEN CORP	25 14	17.75	-0.3	-1.4
DATAPOINT CORP	6 3	4.375	0.3	6.1
DELL COMPUTER CORP	13 7	7.625	-0.2	-2.3
DIGITAL EQUIP CORP	122 86	91	-0.8	-0.8
FLOATING POINT SYS INC	4 2	2.875	-0.4	-11.5
HARRIS CORP	34 25	33.375	0.0	0.0
HEWLETT PACKARD CO	62 44	52	-0.5	-1.0
HONEYWELL INC	80 57	73.875	-0.5	-0.7
IBM	131 106	108.75	-0.6	-0.6
INFORMATION INTL INC	16 13	15.375	0.1	0.8
IFL SYS INC	9 2	7.75	-0.3	-3.1
MAI BASIC FOUR INC	21 8	5.875	-0.8	-11.3
MATSUSHITA ELECT IND LTD	219 158	170	8.0	4.9
MENTOR GRAPHICS CORP	45 23	36.75	-2.5	-6.4
NEC INC	5 1	2.375	0.5	25.7
NOR CORP	67 51	54.25	-1.6	-2.9
PRIME COMPUTER INC	21 12	15.875	-0.5	-3.1
PYRAMID TECHNOLOGY	20 9	19	-1.3	-11.1
SHAREBASE CORP	4 2	2.313	-0.1	-2.6
SILICON GRAPHICS CORP	25 14	17.25	-1.3	-6.8
STRATUS COMPUTER	36 21	28.5	-1.8	-5.8
SUN MICROSYSTEM INC	23 13	16.75	-1.5	-8.2
SYMBOLICS INC	3 1	1.938	0.0	0.0
TECHNICAL COMPUTER SYS	28 14	22.75	-1.0	-4.2
TANDEN COMPUTERS INC	21 12	17.25	-0.8	-4.2
TANDY CORP	49 38	45	-1.4	-3.0
ULTIMATE CORP	14 8	10.25	-0.5	-4.7
UNISYS CORP	38 24	24.5	-1.8	-6.7
WANG LABS INC	11 7	8.125	0.1	1.8
Software & DP Services				
ADVANCED COMP TECH	4 1	1.888	-0.1	-3.5
AMERICAN MGMT SYS INC	19 12	12.125	-1.5	-11.0
AMERICAN SOFTWARE INC	18 8	15.625	-1.9	-10.7
ANACOMP INC	12 5	6.25	-0.1	-2.0
ANALYSTS INTL CORP	20 8	20.25	0.3	1.3
ASHTON TATE	28 17	17	-1.0	-5.8
ASK COMPUTER SYS INC	18 12	12.625	-1.1	-8.2
AUTOCORP INC	40 23	36.25	-0.6	-1.7
AUTO DATA PROCESSING	42 35	40	-0.4	-0.9
IMC SOFTWARE INC	21 8	19.375	-0.4	-1.9
BOOLE & BARRAGE INC	20 9	18.75	-0.5	-2.7
BUSINESSLAND INC	15 10	12.875	-0.3	-1.9
COMPUTER ASSOC INTL INC	22 12	19.875	-20.1	-50.3
COMPUTER HORIZONS CORP	12 7	7.75	0.0	0.0
COMPUTER SCIENCES CORP	58 41	54	-0.8	-1.4
CORPORATE SOFTWARE	16 9	14.75	-1.3	-7.8
COMPUTER TASK GROUP INC	17 12	13.75	0.5	3.6
COGNOS INC	9 5	5.875	-0.1	-2.1
COMSHARE INC	35 18	32.75	-2.0	-5.8
CULLINET SOFTWARE INC	9 4	9.25	1.3	16.6
GENERAL MTRS (CLB E)	54 37	52.375	0.3	0.5
HOGAN SYS INC	7 3	6	-0.1	-2.0
INFORMIX CORP	25 7	9.75	0.1	1.3
INTELLICORP INC	5 2	3.375	-0.9	-20.6
KEANE INC	14 5	14.5	-0.5	-3.3
LEGENT CORP	28 18	25	-0.5	-2.0
LOTUS DEV CORP	27 15	25	-1.0	-3.8
MANAGEMENT SCI AMER	14 6	11	-0.4	-3.3
MICRO PRO INTL CORP	4 2	2.5	0.0	0.0
MICROSOFT CORP	71 45	55	-2.8	-4.8
NATIONAL DATA CORP	34 19	30.375	-1.4	-4.0
ON LINE SOFTWARE INTL INC	7 4	6.625	0.0	0.0
ORACLE SYS CORP	33 15	30.5	-1.9	-5.8
PANOSYS INC	18 12	13.625	-0.5	-3.3
PHOENIX TECHNOLOGIES INC	19 12	12.5	0.0	0.0
POLICY MGMT SYS CORP	31 21	27.75	-2.3	-7.5
PROGRAMMING & SYS INC	19 11	19.25	0.5	2.5
RABBIT SOFTWARE INC	3 1	1.083	-0.2	-18.0
RELATIONAL TECHNOLOGY	21 9	9.875	-0.3	-2.5
REYNOLDS & REYNOLDS CO	34 18	28.875	-0.5	-1.6
SEI CORP	22 16	16.5	0.0	0.0
SHARED MED SYS CORP	18 12	18.875	-1.4	-6.0
SAGE SOFTWARE INC	10 6	8.75	-0.4	-4.1
SOFTWARE PUBLG CORP	28 18	23.625	-0.6	-2.6
STERLING SOFTWARE INC	8 5	7.25	0.1	1.3
SUNGARD DATA SYS INC	20 13	17.375	-0.4	-2.1
SYSTEMATICS INC	37 28	34.5	-0.5	-1.4
Semiconductors				
ADV MICRO DEVICES INC	17 7	9.75	-0.4	-3.7
ANALOG DEVICES INC	16 10	11.125	-0.1	-1.1
ANALOGIC CORP	11 7	11.5	0.0	0.0
CHIPS & TECHNOLOGIES INC	26 11	24.25	1.5	6.6
INTEL CORP	37 19	29.75	-0.5	-1.7
LSI LOGIC CORP	14 8	10	-0.5	-4.8
MICRON TECHNOLOGY INC	26 15	21.375	-3.3	-13.2
MOTOROLA INC	60 36	53.5	-2.4	-4.3
NATL SEMICONDUCTOR	15 7	6.625	-0.5	-7.0
TEXAS INSTRS INC	51 35	40.875	-1.0	-2.4
WESTERN DIGITAL CORP	16 9	9	-1.8	-16.3
Peripherals				
ALLOY CORP	4 1	2.125	0.4	21.4
AM INTL INC	6 4	5.25	-0.1	-2.3
AST RESH INC	17 7	9	-0.5	-5.3
AUTO TROL TECH CORP	6 4	4.875	-0.4	-7.1
BANCTEC INC	15 8	13.75	0.4	2.8
CIPHER DATA PRODS INC	11 8	8.25	-0.5	-5.7
COGNITRONICS CORP	5 2	5	-0.1	-2.4
COMM PERIPHERALS	15 7	12	-2.0	-14.3
DATAPRODUCTS CORP	18 10	13.375	0.1	0.9
DATARAM CORP	11 7	9.375	-0.5	-5.1
EASTMAN KODAK CO	52 42	47.375	-1.8	-3.6
E MC CORP MASS	6 3	5.625	0.1	2.3
EMULEX CORP	12 7	9.25	0.0	0.0
EVANS & SUTHERLAND	22 13	18.5	0.0	0.0
ICOT CORP	4 2	2.375	0.1	5.6
INTERLEAF INC	14 6	8.5	-0.4	-4.2
IONESA CORP	6 4	2.563	0.0	0.0
LEX DATA CORP	4 2	3.5	-0.1	-3.4
MASTOR SYS CORP	4 2	2.063	0.0	0.0
MAXTOR CORP	19 5	9.4	0.4	4.0
MICROPOLUS CORP	19 5	5.25	0.5	8.7
MINISCORP CORP	14 1	2.5	0.1	5.3
MINISISTE MFG & MFG CO	76 35	72.5	-0.9	-1.2
PERSONAL COMPUTER	6 4	4.5	0.2	4.3
PRINTONIX INC	11 7	8.75	0.0	0.0
QMS INC	10 6	8.5	-0.4	-4.2
QUANTUM CORP	21 6	21.5	1.1	5.0
RECOGNITION EQUIP INC	12 6	10.875	0.4	3.6
REXON INC	6 6	7.625	0.0	0.0
SEAGATE TECHNOLOGY	19 7	16.875	-0.5	-2.8
STORAGE TECH CORP	36 11	15.125	-0.3	-1.6
TANDON CORP	3 1	6.625	0.1	1.0
TECHNICS INC	19 13	22.875	-0.5	-2.1
TELEVIDEO SYS INC	1 0	0.375	0.0	0.0
XEROX CORP	96 52	61.5	-1.9	-3.0
Leasing Companies				
AMPLICON INC	115 11	14	0.3	1.8
CAPITAL ASSOCIATES INTER	9 5	7.25	-0.3	-3.3
NATIONAL INC	28 19	26.5	0.4	1.4
COMDISCO INC	7 0	0.963	-0.1	-18.2
CONFIDENTIAL INFO SYS	17 13	16	0.0	0.0
LDI CORPORATION	5 3	3.5	0.1	3.7
PHOENIX AMERN INC	9 5	8.5	-0.3	-2.9
SELECTRIX INC	5 3	8.5	-0.3	-2.9

ECHO=NEW YORK-A=AMERICAN-Q=NATIONALS-S=SPIT

## Heating up

Summer temperatures are climbing, as is investor activity

Investors were able to act on more than just rumors and expected product releases in one of the busiest weeks in recent memory for the computer industry. Computer Associates International, Inc., which offered to buy Cullinet Software, Inc., split its shares early in the week. CA closed Thursday at 19%, down 1/4 of a point. Lotus Development Corp. finally came out with Release 3.0 of its 1-2-3 spreadsheet — and fell 2 points to close at 24. Prime Computer, Inc., which has been trying to avoid a takeover by MAI Basic Four, Inc., announced it has received an offer from another firm. Prime closed at 15%, down 1/4 of a point, while MAI finished unchanged for the week at 6%.

IBM's announcement of an Intel Corp. i486-based product had little effect on investors; it closed at 109%, down 1/4. On the other hand, competitor Compaq Computer Corp. climbed 3 1/4 points to finish at 95.

IBM's improved performance in the PC market, however, seemed to cool off Apple Computer, Inc.: Apple dropped 1 1/4 points to close at 43%. Quantum Corp. continued to reap the rewards of its improved outlook; it climbed 2 1/4 points to close at 21 1/4.

JOSEPH J. FATTON

# IS shuffle: Three execs move on

BY CLINTON WILDER  
and ALAN J. RYAN  
CW STAFF

Ron Brzezinski, the highly visible vice-president of information services at Quaker Oats Co., has quietly departed from the company.

Brzezinski's exit was the most notable of three transitions in the information systems profession earlier this month.

Banking automation pioneer John F. Fisher said he will retire from Banc One Services Corp. at the end of the year, and John F. Link, director of information systems services at Sun Co., signed on with a home shopping service firm as its top IS executive.

Brzezinski, who joined Chicago-based Quaker in 1985 as vice-president of information services, is currently listed as an

inactive employee. He will remain on the payroll until next spring.

One company source said such generous severance packages are not uncommon for high-level departures at Quaker.

Brzezinski's position was filled earlier this month by Kevin McShea, who had worked under Brzezinski for approximately nine months.

In an interview last week, Brzezinski said he was "in the process" of leaving the company. He declined to comment on his reasons for departing.

The former vice-president said he has not made any definite plans for his future career path.



Brzezinski no longer active at Quaker

He has worked as a consultant in the past and said returning to that field is a possibility.

Prior to joining Quaker, Brzezinski was manager of consulting services at Nolan, Norton and Co.

During his tenure at Quaker, Brzezinski worked to centralize the corporate database while standardizing distributed systems and end-user access tools [CW, Aug. 15, 1988].

## ATM pioneer

Fisher, 61, Banc One Services' senior vice-president, is considered one of the most progressive and visionary senior executives in the use of IS.

He is regarded as the pioneer of automated teller machines and bank credit cards, among other innovations [CW, April 25, 1988].

Fisher's position will not be filled. "John won't really 'retire,'" said John Russell, Banc One vice-president and director of corporate communications. "For the next five years, he will be consulting to Banc One and still will be involved with every-

thing we do."

Link, a veteran of more than 20 years at Radnor, Pa.-based Sun, became senior vice-president of IS at QVC Network, a West Chester, Pa.-based home shopping TV service with about \$300 million in revenue.

Link's position as head of IS at Sun's corporate headquarters will be filled on a temporary basis by Thomas Fitzpatrick. The position will be eliminated by the end of the summer, however, as Sun moves to a much more decentralized IS strategy, according to Jack Donahue, director of IS at Sun Refining and Marketing Co., the largest business unit.

Most of Sun's 85-member corporate IS staff will be transferred to business unit functions, though they will not necessarily move physically, Donahue said. "There will be someone in charge of a small corporate applications group but no functional leader at the corporate level," he said.

## Concerns

FROM PAGE 1

Kumar said. According to Kumar, CA's Application Construction Environment will allow the company to run multiple hardware, databases and software.

The acquisition — financed with a proposed stock swap valued at \$333 million, based on the per-share price of CA prior to the announcement — adds application-generation tools and vertical applications in banking, human resources, manufacturing and distribution to CA's expansive product catalog. More importantly, analysts said, the acquisition also buys a high-profile installed base.

Some members of that installed base were clearly concerned last week over support and maintenance questions that have followed previous CA acquisitions. The IS director of a multinational *Fortune* 500 company, who requested anonymity, said that the acquisition will force him to explore IBM's database alternatives. "We have to regroup and look at IBM," he said, "because I don't think that CA can buy IBM."

The company standardized on IDMS/R a few years ago, but the IS director said that he is concerned that his "maintenance costs will increase and support will drop."

At least one company is no longer considering buying from Cullinet. Arthur Schmersal, section manager of information systems management services at Cullinet user Loral Corp. in Litchfield Park, Ariz., said last week's news put Cullinet out of the running. "We'll probably go back to square one," he said. "We've seen some changes at IBM recently that are going to

make us seriously consider that now might be the time to move to DB2."

One long-term CA customer had different concerns. Wayne L. Bell, data center manager for Dallas-based Dr. Pepper Co./The Seven-Up Co., asked, "How can you expect a company that keeps buying companies and product lines to be able to tie it all together, to be able to make sense of its own strategy, without a lot of duplication on one hand and accidental neglect on the other?" With a company the size of Cullinet to digest, Bell said, CA's service shortcomings — which he believes are inadvertent — could get worse before they get better.

## Don't worry, be happy?

Reaction from other Cullinet customers ranged from resigned to indifferent. "I'm not happy, but I'm not outraged," said IDMS/R user James Warena, manager of database administration at Public Service Co. of New Hampshire in Manchester. "Even if we were outraged enough to take action, it would take years for us to do something about it."

"Cullinet could go out of business next week, and we'd survive just fine," said Harold Cole, data processing director at the South Carolina Department of Education in Columbia. "The software we have has been around for a long enough time to be pretty bug-free; we're not dependent on maintenance."

Analysts generally applauded the strategy behind the acquisition. Aside from its products for IBM mainframes, Cullinet also provides CA with Enterprise/DB, a fully relational high-transaction database manager that "has the best performance on the Digital Equipment Corp.

VAX, bar none," said Charlotte Walker, vice-president at County Natwest USA, a consultancy in New York.

Robert Anderson, vice-president at Sutro & Co., a consultancy in San Francisco, said he regarded Enterprise/DB as a pivotal purchase. According to Anderson, Cullinet had been creating an interface between Enterprise/DB and IDMS/R, and a similar interface between CA's other databases would create a potential market for Enterprise/DB of about 4,000 sites.

Past acquisitions have gener-

ally been followed by hefty cost-cutting from the ranks of acquired companies. Charles Wang, chairman and chief executive officer of CA, said his company has embargoed hiring until placements of Cullinet employees can be accommodated.

However, analysts said that as many as 40% of Cullinet employees could be on the chopping block within days of the deal being completed in August if shareholders of both companies approve the action. One source said CA is maintaining a big severance fund, including approxi-

mately 24 golden parachutes worth about \$10 million.

Cullinet founder and Chairman John Cullinane repeatedly emphasized the concern for employees that went into this deal; one of the terms is that CA will honor the Cullinet severance package, known to be one of the most generous in the industry.

Cullinane, who returned from retirement a little more than a year ago, said he will not become part of the larger firm.

Senior editors Rosemary Hamilton and Nell Margolis contributed to this report.

## Gun-shy

FROM PAGE 1

ble up Cullinet Software, Inc., and a few days later it swallowed graphics supplier Cricket Software, Inc., which did little to change its image.

In the wake of CA's latest acquisitions, industry opinion sharply diverged with regard to the impact of an ever-swelling CA on the software sector. While some observers said they believe that the CA juggernaut will crush innovation, others predicted it will inspire it.

"Consolidation potentially eliminates product choices for the end user," said Robert Anderson, an analyst at Sutro & Co. in San Francisco. However, Anderson pointed out, there is a flip side: "What if nobody bought Cullinet, and the company, struggling for life, had to eliminate product lines? CA is rescuing doomed product lines and keeping them available to the users who depend on them."

There is likely to be little effect on such database players as Oracle Corp. and Relational Technology, Inc., said Charles

Federman, a partner at Broadview Associates, an investment consultancy based in Fort Lee, N.J. "Their products, reputation and portability have already gained them entrenched customer bases," he explained.

Federman said he believes that "CA is not inhibiting innovation." The company has concentrated on acquiring large companies with good products and shaky finances: "The innovative companies are still out there."

However, John Burton, executive vice-president of Westboro, Mass.-based Business Software Technology, Inc., said users attracted by a small company's technology offerings will nonetheless hesitate to sign on with a vendor that could easily end up being acquired by CA or another large firm. Entrepreneurs, recognizing this, could become gun-shy about pursuing new and exciting technologies.

According to Burton, one of the earliest beneficiaries of the CA-Cullinet deal is likely to be IBM. Cullinet users who are unsure of the shape their vendor and its products will take under CA stewardship, and first-time software customers reluctant to

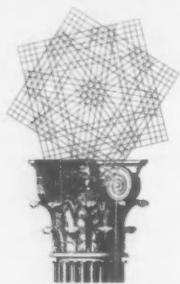
commit to companies that might end up in the CA stable, might arrive at the same conclusion, Burton said: "Now is a good time to move to DB2."

## Feeding frenzy

CA continues its software firm binge, with Cullinet the newest feature on the menu

- '82 **Cricket Software**
- '83 **Stuart P. Orr Associates**  
Information  
Unlimited Software
- '84 **Sorcier**  
Johnson Systems  
Arday Computers
- '85 **Walen Software**
- '86 **Imaco**  
Software International  
from General Electric
- '87 **Planet**
- '88 **QDR**
- '89 **Cricket Software**  
Cullinet (pending)

CW Staff; John York



## 'Search for New Heroes' honors 11 for 'courage' at CW Smithsonian Awards

*Winners pursued projects that seemed impossible — but worked*



▲ **Max Hopper**, American Airlines' senior vice-president of IS, attributed the acclaimed Sabre's designation to its pioneering role in reservation systems technology.



◀ **IDG Chairman Patrick J. McGovern** congratulates **Lewis Sadler** of the University of Illinois' Department of Biomedical Visualization for the system developed for the National Research Center for the Identification of Missing Children.

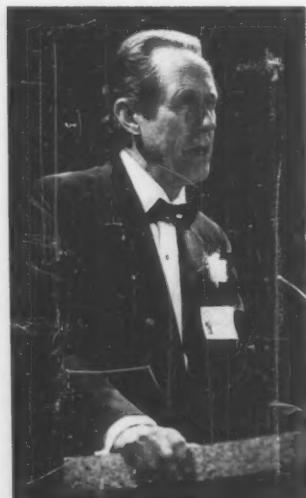


◀ **Sierra/Misco President David Curtis** (right) looks on as **Roger Kennedy** (left), director of the Smithsonian Institution's National Museum of American History, explains Sierra-Misco's work in developing the Passaic River Basin Early Flood Warning System.



◀ **David Caresio**, president of Fidelity Brokerage Services, Inc., told attendees that during the October 1987 stock market crash — when most brokers were unreachable, buried under an avalanche of panicked inquiries — the Fidelity telephone voice-recognition system handled one million quote calls. That system, and a consumer PC access system, earned Fidelity its award.

**Hal Uplinger's company**, ▶ Uplinger Enterprises, produced 1985's Live Aid benefit concert using worldwide satellite technology linkups. Two billion people in 155 countries saw the live broadcast, which raised \$127 million for famine relief.



**T**echnology applications that seem to have little in common — including a flood-warning system and a computer-aided learning program — were collectively and individually honored with awards last week at the first *Computerworld* Smithsonian Awards. Eleven companies and organizations were selected from among 160 nominees for recognition of innovative applications of information technology.

An audience of about 500 people from industry, academia and private enterprise attended the awards banquet in New York, which was billed as a "Search for New Heroes." *Computerworld* President and Publisher Fritz Landmann called the 160 nominees "the heroes of today, who solve problems with the weapon of information technology instead of the sword of the heroes of old."

The following are the winners by category:

- **Business and related services** — **Bell & Howell Co.** The Chicago-based company's Image Search Plus System allows users to instantly store and retrieve information using optical disk technology, which is adaptable to scanning, printing and microfilm applications.
- **Education** — **Orangeburg, S.C., School District 5.** In 1975, only 14% of the students in this rural school district scored above the national average for SAT scores, and the dropout rate was 8%. Last year, 57% of the district's 6,500 students scored above the national average, and the dropout rate declined to 1%.

The difference was in large part attributable to a computer-aided learning program that has been implemented in the last six years in kindergarten through

ALL PHOTOGRAPHS BY KEN KEMER



12th grades. "We're setting the foundation for our future," said Superintendent James Wilsford, who represents a school district that includes two of the poorest areas in the state — 70% of the students qualify for subsidized school meals.

• **Energy, natural resources and agriculture** — **Sierra/Misco, Inc.** The Passaic River Basin Flood Warning System is a coalition of organizations tied together by a local-area network to form a massive early-warning system. Flood-alert time has been reduced from the six hours necessary in 1984 — when a Passaic River flood caused \$350 million in property damage and four deaths — to two hours today.

• **Finance, insurance and real estate** — **Fidelity Investments.** Fidelity's on-line investment information systems are accessible to anyone with a terminal or a Touch-Tone telephone. The systems serve two million people per week and are so easy, "even I can use them with my Apple IIE," said David Cariseo, chairman and president of Fidelity Brokerage Services.

• **Government and nonprofit** — **BI, Inc. and the University of Illinois** (tie). Boulder, Colo.-based BI provides state correctional institutions with electronic monitoring devices and voice-recognition systems for offenders serving time in their homes.

The University of Illinois' Missing Children Project uses research on aging to create high-resolution visual images of children as they might look years from the time they disappeared. Approximately 29 children have been recovered with this method.

• **Manufacturing** — **The University of Iowa.** The University's Center for Simulation and Design Optimization of Mechanical Systems has developed a program intended to simulate performance of prototype motor vehicles operated under various conditions by a live test driver to detect safety flaws in design.

• **Media, arts and entertainment** — **Uplinger Enterprises.** Hal Uplinger produced 1985's Live Aid benefit concert, which used worldwide satellite technology linkups for the first time.

Two billion people in 155 countries saw the live broadcast, which raised \$127 million for famine relief. The technology has been used since the concert for similar projects.

• **Medicine and health care** — **LC Technologies, Inc.** The Fairfax, Va., company's Eyegaze System allows individuals to "type" with their eyes by looking at appropriate keys; they can also print the typed text and vocalize via speech synthesis.

The Eyegaze System differs from other, similar systems in its use of an infrared tracking beam that eliminates the need to attach wires to the operator's head and eyes.

• **Transportation** — **American Airlines.** American's Sabre computer reservation system, about to celebrate its 30th anniversary, is the nation's first and biggest reservation system and the largest real-time, nongovernmental computer network. It can process more than 1,800 transactions per second.

• **Wholesale and retail sales** — **Innovis Interactive Technology.** The Tacoma, Wash.-based firm has developed an interactive, personal computer-based in-store system that lets homeowners design decks for their homes.

RICHARD PASTORE



▲ **Richard Willmarth** is vice-president of BI, Inc., developer of a system that monitors the movement of criminal offenders serving alternative sentences outside of penal institutions.



▲ **Richard A. Comber Jr.** (above) at Bell & Howell's Document Management Products Division, accepts award for the Image Search Plus System. Mark Lembersky's (above, right) firm, Innovis Interactive Technologies, develops home improvement design systems installed in retail building-supply stores.

**Computerworld President and Publisher Fritz Landmann** (left) with **Melissa Bunch** (center) and **Bennett Smith Montgomery**, two students from Orangeburg, S.C., School District 5, who explained the benefits derived from the use of computer-assisted learning and teaching systems in the district.



ROBERT KLEIN



◀ **Dixon Cleveland** of LC Technologies explains the operations of the company's Eyegaze Computer System, which uses a video camera and image processing software to determine the point at which a user is looking at a screen, enabling operation of computerized functions without the need for keyboard or other manual input devices.

**Edward Haug**, director of the Center for Simulation and Design Optimization of Mechanical Systems at the University of Iowa, said the award "makes a big difference in establishing our credibility," adding that he hopes it might spur Congress to approve a proposal to adapt the project in a national safety program.



## Uncaped crusaders

Unlike Batman, the heroes of technology lauded at the *Computerworld* Smithsonian Awards forum at the Marriott Marquis Hotel in New York City will not have their images emblazoned on T-shirts and coffee mugs. Their achievements, however, will remain before the public long after the caped crusader's box-office bonanza has petered out.

The 11 award-winning projects will be showcased in a major exhibit on information technology at the Smithsonian Institution's National Museum of American History, where six to seven million visitors per year seek inspiration from the country's past, present and future.

These modern heroes embody the courage that is somewhat faltering in the heart of today's U.S. business community, said Patrick McGovern, chairman of the board of IDG Communications, Inc.

A total of 160 nominees were chosen by the Chairman's Committee, which included IBM's John Akers, Digital Equipment Corp.'s Ken Olsen, Microsoft Corp.'s Bill Gates and 40 others.

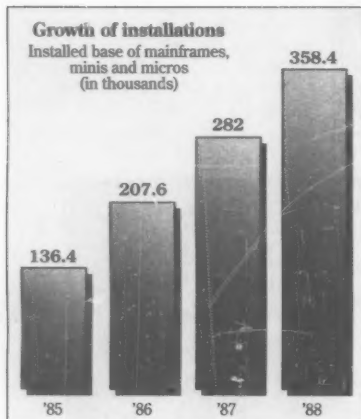
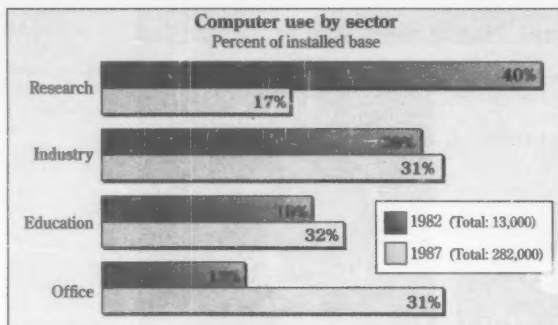
Finalists were judged on benefit to the target group and to society; importance and effectiveness of information technology; and, among other factors, the overall scope of the achievement.

RICHARD PASTORE

## TRENDS

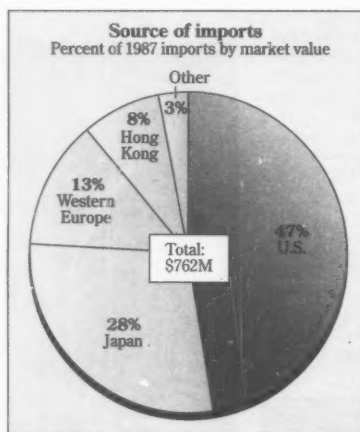


**Computers first** made headway in China's scientific and research facilities. Office applications, however, have since gained ground. By 1987, computer use in offices had attained an equal footing with use in industry.



**Imports make up** about 60% of the Chinese computer market. Among importers to China, the U.S. accounted for about half of the sales in 1987. Five years earlier, U.S. vendors claimed only 18% of the \$108 million market. Japan slipped to 28% from 48% during the same time frame.

**The installed base** has risen steadily but is hindered by several factors, including the following: limited capital for purchases; high prices caused by low-volume, high-cost domestic production and heavily tariffed imports; and protectionist trade policies that restrict foreign exchange.



SOURCE: THE META GROUP; DATA COMPILED BY

CW CHARTS FRANK C. O'CONNELL

## NEXT WEEK

With 44 million words, the *Encyclopaedia Britannica* is one of the most famous databases in the world. The IS executive responsible for it — a serious-minded Harvard graduate — is pursuing user-IS partnerships. Encyclopaedia Britannica USA's Nathan Taylor appears in *Manager's Journal*.



DAVID JOEL

To keep pace with changing corporate strategies, IS must review and update its mission. The old approach to development cannot meet present needs. IS must embrace a mission statement that is based on partnership with both users and top managers. In *Depth* explores the challenges involved in recasting the IS mold.

## INSIDE LINES

## Lotus/DBMS spotted

The general public had never before seen the mysterious Lotus/DBMS, which was announced in April 1987. But those who attended a special luncheon following Lotus' annual meeting last week were given the privilege of seeing a forms tool. The system was not live, but it did show off the ability to work with highly detailed forms tied to back-end data. The screen shots did little, though, to illuminate the dark recesses of the company's strategy. There was no mention of query or report-writing tools and no firm comment on what the Lotus' back-end server strategy will be.

## Pasture-switched network

When New York Life recently established a group-claims processing operation in rural Ireland, it was puzzled by initial high error rates on its telecommunications lines. Corporate Vice-President Howard Maroney said the problem was traced to a nearby electrified cow fence, which caused interruptions whenever a wandering bovine activated it. The Irish Postal Telephone and Telegraph authorities solved the problem by ordering the cattle farmer to put a timer on the fence to shut it off when New York Life sends its batch processing back to the U.S., Maroney said.

## Roll out the barrel

DEC, which has been rolling out enhancements at a rapid clip this year, has two more planned for July. Dale Kutnick, president of the Meta Group in Westport, Conn., says there will be a follow-on product for the VAX 6300, possibly called the VAX 6600 — IDC's DEC Advisory Service, however, predicts a July rollout of a VAX 6400 — offering a 20% price/performance improvement. At the same time, DEC is also expected to announce a new version of its Decstation 3100 using the new R3000 RISC chip from Mips Computer Systems instead of the older R2000 chip used in the original Decstation 3100. IDC also predicts an X Window System-based terminal and a machine labeled the Decstation 2100.

## Look around corners

IBM is working on a PS/2-based Netview offering that will not manage other vendors' hosts but will "see around" those hosts to diagnose problems on communications lines behind them, according to William M. Vetter, a manager of the state of Illinois' Bureau of Information & Communications Services, which hopes to be one of the product's first users.

## Stepped on tongue

"The Stalinist server from Ashton-Tate" was how Oracle CEO Larry Ellison last week characterized the primary competitor to his company's new PC Server products. "Oracle's democratic server talks to IBM's DB2 and to Tandem's Non-stop SQL," Ellison said at the height of the PC Server press conference. "The Stalinist server from Ashton-Tate can't even talk to itself." What's Stalinist about it, you ask? In Russia, Stalin was a feared tyrant who took no prisoners — he buried them. Industry analyst Andrew Seybold, whose testimonial was part of the server announcement, said he had already complained that the politically charged remarks were inappropriate.

## Hunger artist

McCormack & Dodge users were treated to a number of Grand Ole Opry acts at their annual conference in Nashville last week, but some users thought the hottest new talent on the scene could just as well have been Ol' Frank Dodge himself. Pointing to a graph of revenues covering the past 20 years, he noted that income from 1969 to 1974 hardly showed up on the charts. Then, pointing to his own diminutive, wiry frame, he said, "This is what happens when you starve for five years."

*It's going to be a long, hot summer for Cullinet customers awaiting the scheduled completion in August of the acquisition by CA. But you can release your tension into the Computerworld bulletin board (508-626-0214); we'll monitor the traffic and try to quash or confirm the many rumors that are likely to be making the rounds. Or you can call News Editor Pete Bartolich at 800-343-6474 or 508-879-0700 for an update on what seems real and what doesn't.*



# Response Time is Money.

Poor CICS response time is expensive. The longer users wait, the less they get done, the more your bottom line suffers, and the more you get blamed. But good response time can also be expensive - when it's purchased through more hardware or overworked systems staff.

## No guesswork

Candle helps keep CICS response time and your budget at a minimum with software that precisely pinpoints the causes of poor CICS performance. Our end-to-end response time feature even tells you whether the problem is in the host or in the network. And that improves the response time of your staff.

## Faster solutions

The OMEGAMON® family of products for CICS keeps your user service levels on target by detecting availability threats and slowdowns immediately, analyzing the cause for you, and recommending the solution. A single Status Monitor™ screen keeps you on top of your entire CICS network - across CPUs and across geographic locations. OMEGAMON eliminates the time-consuming

process of analyzing irrelevant resource data by doing the analysis for you.

Our products also help you budget. They give you trending and capacity planning information so you can forecast future needs and make maximum use of existing resources. With software, not by throwing more iron at your problems before it's really needed.

## Total support

As for our response time, Candle's support team is available round-the-clock, around the world, every day of the year to answer your questions and help you get the best performance from your CICS system. And Candle Education helps you improve your own performance.

Is your response time costing you money? It's worth your time to find out by calling your Candle Account Representative or Terry Forbes today at (800) 843-3970.

**!Candle®**

Copyright © 1989 Candle Corporation. All Rights Reserved.



# There's only one software company that can lead you into the next millennium.

To meet the challenges that await you in the next age of computing, it only makes sense to follow an experienced guide ■ A company with a proven track record of success, leadership and technological achievement ■

McCormack & Dodge is just that company ■ We can point to a 20-year history of leadership in Human Resource and Financial software ■ A history marked by accomplishments like the first truly

integrated processing environment - Millennium® ■ The first DB2 systems development tool from an applications software vendor ■ And now, the first true SAA workstation ■

Call 1-800-343-0325 and ask for our white paper which describes in detail how McCormack & Dodge is dealing with your concerns about SAA ■ You'll find out why our 20 years of success is just what you need to face the next 20 years of change ■

20 YEARS OF SUCCESS IN FINANCIAL AND HUMAN RESOURCE SOFTWARE.

**McCormack & Dodge**

**IBM** a company of  
The Dun & Bradstreet Corporation

